JANUARY 14, 1933

Railway Age

Founded In 1856

GENEVA COLLEGE LIBRARY,
No.
BEAVER FALLS, PA.

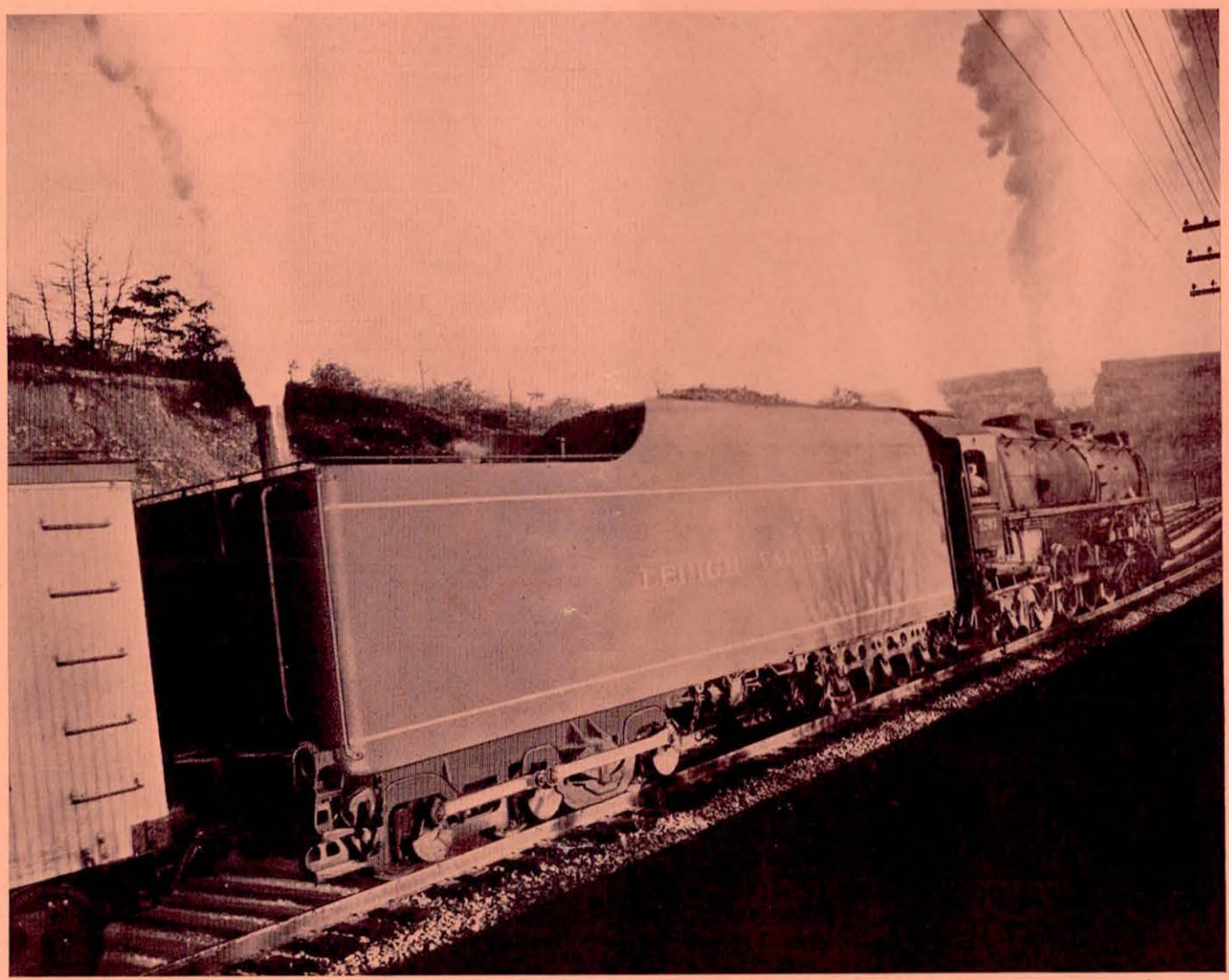
The Railways and Business Improvement

"NO better evidence of the change in the trend of general business that began last summer could be afforded than the facts regarding railway freight traffic and earnings in the first eight months, and in the last four months of 1932. In the first eight months of 1932, freight car loadings were 28 per cent less than in the first eight months of 1931. In the last four months of 1932 they were only 17 per cent less and in December, only 9 per cent less. . . . .

"In the first eight months of the year, the total net operating income earned was $152,295,000 or 57 per cent less than in 1931, while in September, October, and November, it was $147,665,300 or only 5.6 per cent less than in 1931. . . . .

"The railways actually began to contribute toward the improvement of general business as soon as their own business began to improve. For example, they employed 43,000 more men in October than in August. They have also increased their purchases since their business began to improve."—Excerpts from the leading editorial in this issue, entitled "Railway Management in 1933".

The Auxiliary gives the effect of reduced ruling grades



The reserve of tractive force, amounting to from 10,000 to 18,000 pounds, made available when a Bethlehem Auxiliary Locomotive is installed under the tender of a locomotive, is equivalent to a substantial reduction in the ruling grade. With the Auxiliary to fall back on for the conditions demanding maximum tractive force, the tonnage of trains can be increased by 15 to 25 per cent, which results in decided operating economies.

Especially favorable results are obtained by using the Auxiliary Locomotive on high-wheel fast-freight engines. In addition to the advantage already mentioned, further savings are realized from the fact that, with the increased flexibility due to the Auxiliary, these fast-freight engines become available also for either slow-freight or passenger service, if operating conditions make such use desirable.

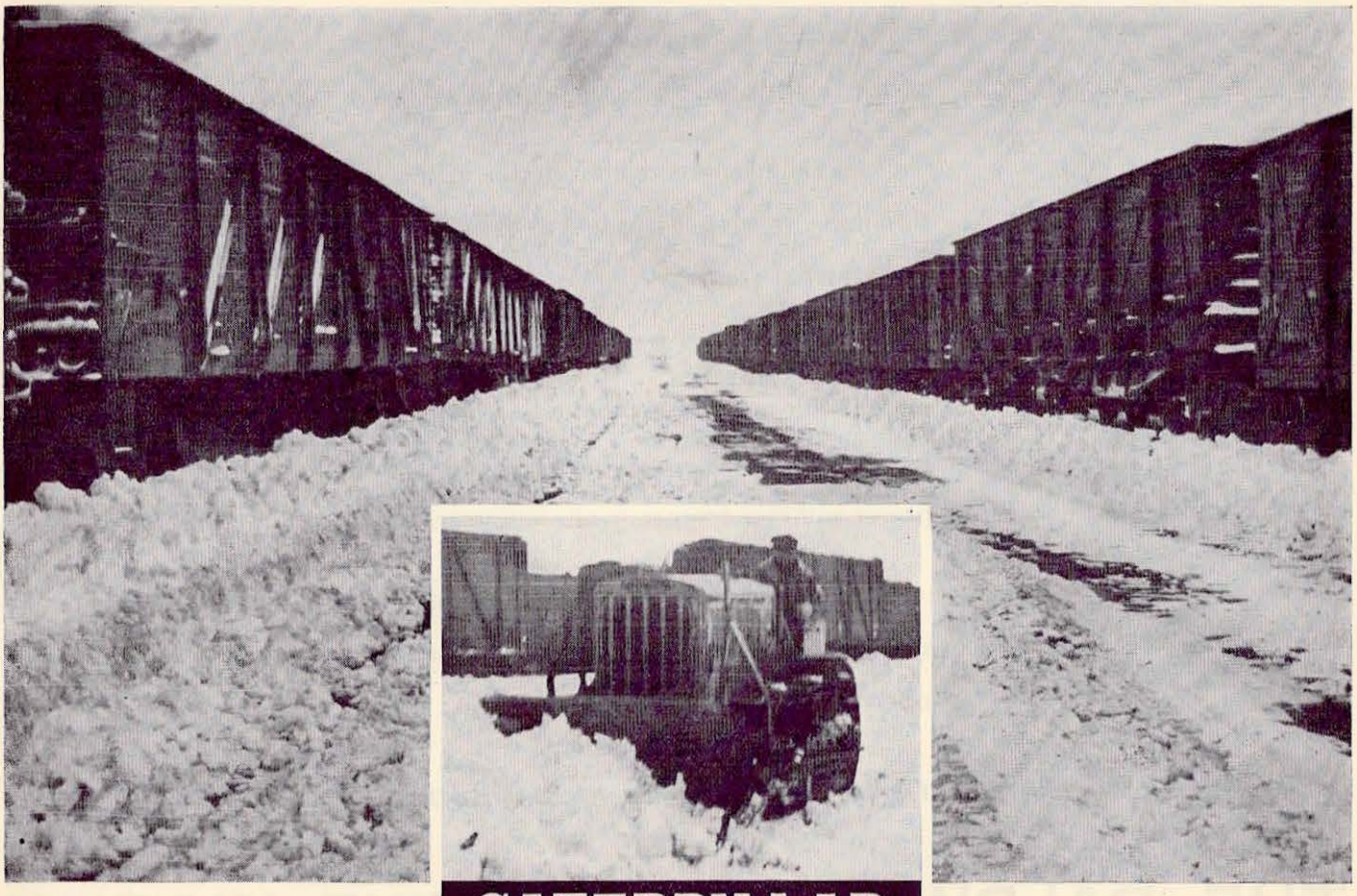
BETHLEHEM AUXILIARY LOCOMOTIVE

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. Baltimore, Washington, Atlanta, Pittsburgh, Buffalo (Hamburg Turnpike, St. Paul, Milwaukee, St. Louis, Houston, Dallas. *Pacific Coast Distributor:* Seattle, Honolulu. *Export Distributor:* *District Offices:* New York, Boston, Philadelphia, York, Wilkes-Barre, Lackawanna, N. Y.), Cleveland, Cincinnati, Indianapolis, Detroit, Chicago, Pacific Coast Steel Corporation, San Francisco, Los Angeles, Portland, Bethlehem Steel Export Corporation, New York.

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, March 9, 1928, at the Post Office at East Stroudsburg, Pa., under the act of March 3, 1879. Application pending transfer as second class matter to Philadelphia, Pa., Post Office.

Taking advantage of WINTER

SHIPPER, consignee and passenger remember and depend upon freedom from the snow nuisance where there's a plow-equipped "Caterpillar" Tractor on the job. For the snow hardly lights before it's whisked out of the way. The "Caterpillar" engine delivers such rugged power, even the deepest drifts are speedily pushed aside. From the property line to the warehouse door the team tracks, drives, and streets are kept open for the free movement of normal freight tonnage. And with snow-plow or broom, the "Caterpillar" Tractor clears the snow from station platforms and street crossings. It maneuvers nimbly in narrow quarters to enable its one-man "crew" to reduce the need for hand-shoveling. Then the "Caterpillar," equipped with a mechanical loader, scoops the snow piles and windrows into trucks or gondolas for complete disposal. . . . Effective, low-cost snow removal with the "Caterpillar" Tractor builds good-will, boosts revenue. And there are other important railroad jobs every month of the year which the versatile, dependable "Caterpillar" Tractor does better, quicker, cheaper!



Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

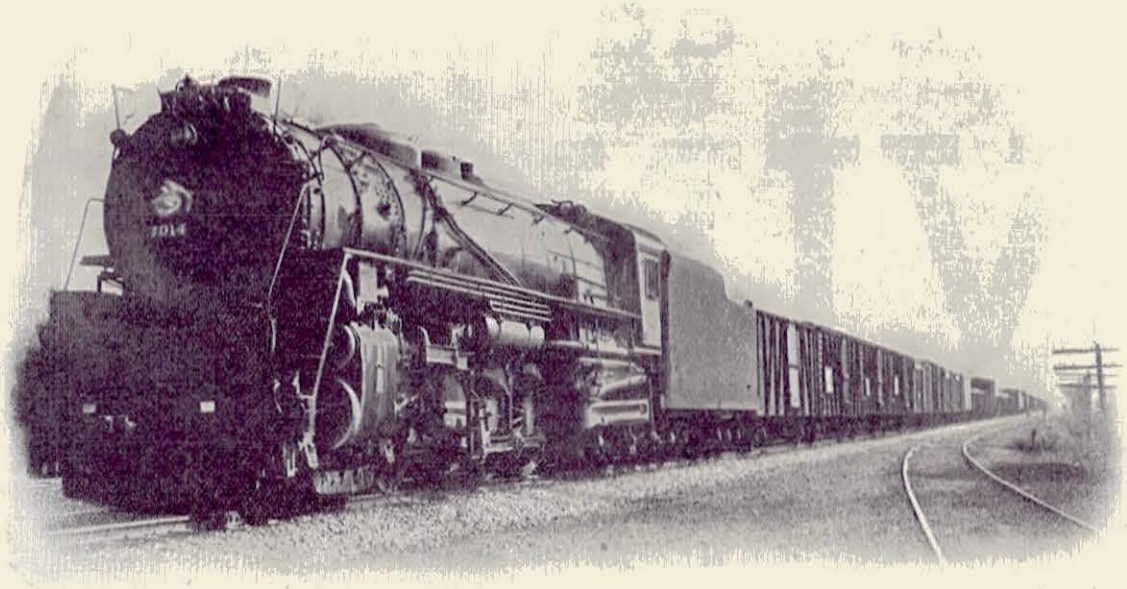
Track-type Tractors Road Machinery
Combines

(There's a "Caterpillar" Dealer Near You)

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

Prices — f. o. b. Peoria, Illinois

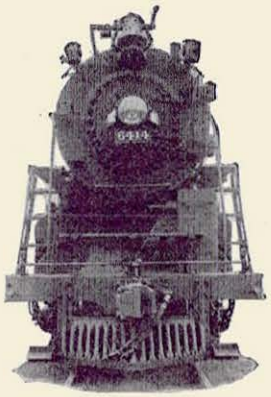
FIFTEEN . . .	$1100	THIRTY-FIVE	$2400
TWENTY . . .	$1450	FIFTY . . .	$3675
TWENTY-FIVE	$1900	SIXTY-FIVE .	$3850
DIESEL	$6500		



WHY NOT SAVE ON LOCOMOTIVE OPERATING EXPENSE?

Here is a group of accounts covering approximately 30 per cent of the total operating expenses of the Class 1 railroads.

It is the largest related group in the cost of producing transportation but—**it also offers the greatest opportunity for effecting substantial savings.**



This can be accomplished by replacing obsolete or inefficient power with modern locomotives which operate at greatly reduced cost per mile. Reduced maintenance alone will often pay for the new power within a comparatively few years.

As business increases, the savings effected by the immediate installation of modern power will be multiplied, insuring maximum net operating income for the future.

It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

Published every Saturday by the Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa., with executive offices at 30 Church Street, New York

SAMUEL O. DUNN, *Chairman of Board*
HENRY LEE, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
ROY V. WRIGHT, *Vice-Pres. and Sec.*
FREDERICK H. THOMPSON, *Vice-Pres.*
GEORGE SLATE, *Vice-Pres.*
ELMER T. HOWSON, *Vice-Pres.*
F. C. KOCH, *Vice-Pres.*
JOHN T. DEMOTT, *Treas.*

CHICAGO
105 West Adams St.

WASHINGTON
17th and H Streets, N. W.

CLEVELAND
Terminal Tower

SAN FRANCISCO
215 Market St.

Editorial Staff
SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. A. DOSTER
JOHN C. EMERY
MARION B. RICHARDSON
H. C. WILCOX
NEAL D. HOWARD
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
GARDNER C. HUDSON
M. H. DICK
S. R. HAMILTON

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol 94 January 14, 1933 No. 2

In This Issue

All-Welded Cars for Transporting Transformers ..... Page 36

Oscar M. Bloch, engineer in the traffic department of the General Electric, tells how that company met a special transportation problem by designing two cars of 260,000 lb. capacity for hauling eight transformers weighing over 200,000 lb. each.

Reduced Inventories Make Room for New Materials 39

A statistical analysis shows an improved condition on all roads, despite heavy stocks of old material and scrap.

Jetting Solidifies Large Embankment 41

Tells how this method, employed on the Cincinnati Union Terminal project after a thorough study of filling material, proved highly successful.

EDITORIALS

Railway Management in 1933 33
Railway Purchases and Business 35

GENERAL ARTICLES

All-Welded Cars for Transporting Transformers, by Oscar M. Bloch 36
Five Roads Protest Against Cumberland River Expenditures 38
Reduced Inventories Make Room for New Materials 39
Jetting Solidifies Large Embankment 41
Freight Car Loading 28,194,828 Cars for 1932 44
I. C. C. Cannot Order Line into New Territory 44
Railway Employees Ask Retirement Insurance 46

NEWS 48

REVENUES AND EXPENSES OF RAILWAYS 57

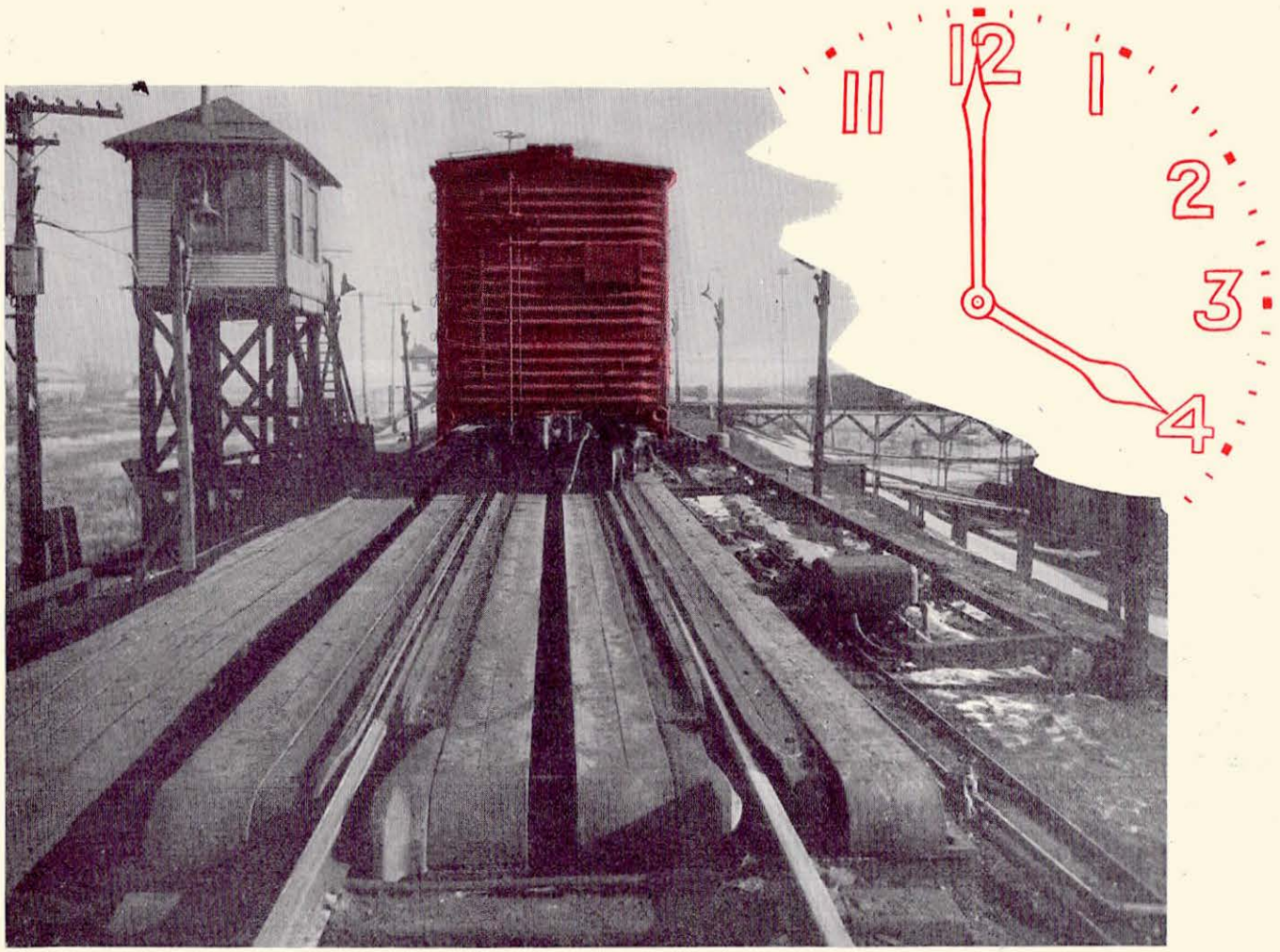
The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Another Way

In many freight terminals empty foreign equipment awaiting classification is frequently detained because it is necessary to give preference to revenue freight. Installations of "Union" Electro-Pneumatic Car Retarders greatly expedite this movement of foreign empties. The greater peak capacity afforded by car retarders results in trains being classified immediately upon entering the yard, whether they are manifest,

DISTRICT OFFICES

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO



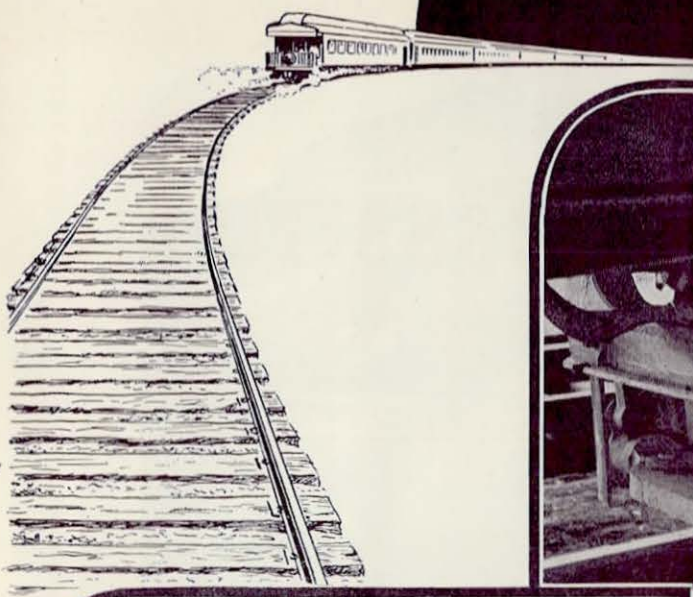
to Save Per Diem

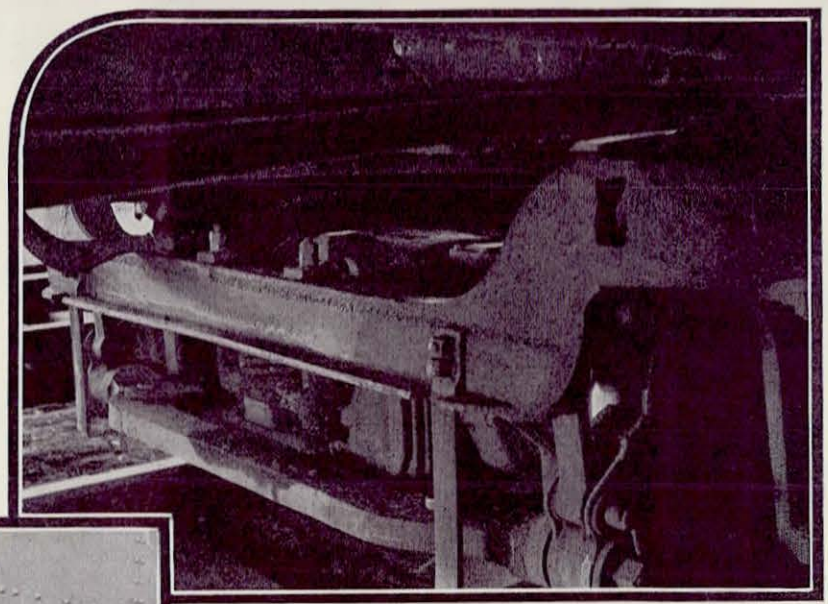
drag freight or empties. In other words, empties as well as loads are handled currently. In one such yard this resulted in a saving in per diem alone of approximately 25,000 car days a year; in another yard, 14,000 car days. This is but one of the many money saving advantages of "Union" Electro-Pneumatic Car Retarders. Our nearest district office will be glad to tell you about the others upon request.

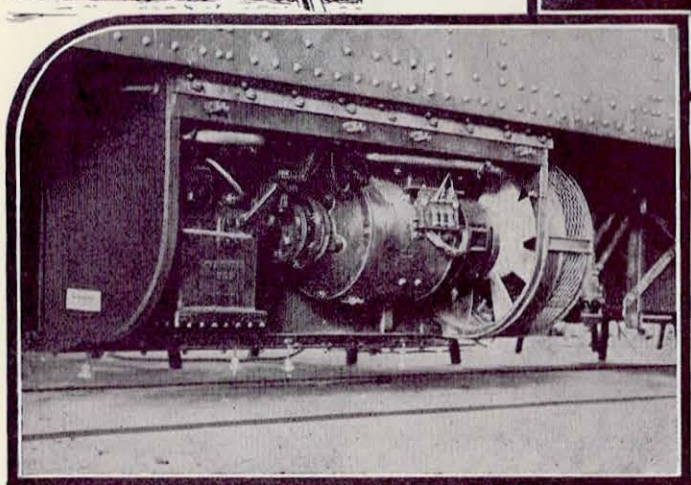
Union Switch & Signal Co.
SWISSVALE, PA.

1881 1933

600,000 of—



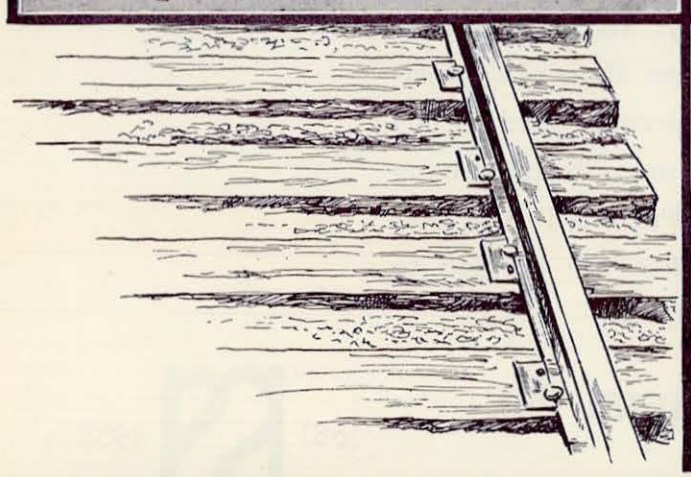


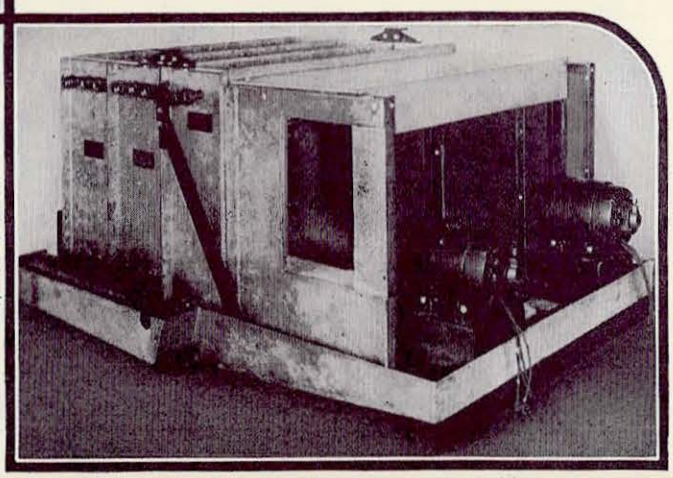


Above—This 15-kw. gear-driven Axle Generator supplies ample power for air conditioning, car lighting, and battery charging.

Left—The Refrigerating Unit mounts under the car floor. Its a-c.–d-c. motor makes possible the use of terminal a-c. power for pre-cooling of cars prior to departure.

Below—The Air Conditioning Unit, which fits into the car roof, cools, dehumidifies, and ventilates.





COMPLETE AIR CONDITIONING

CAR MILES *successful performance*

with

WESTINGHOUSE AIR CONDITIONING

IN June, 1932, ten cars, constituting the full requirements for both sections of the Illinois Central's "Daylight Special," operating between Chicago and St. Louis, were equipped with Westinghouse Air Conditioning. Since then this equipment has operated approximately 60,000 miles per car, or a total of *600,000 car miles of highly successful performance.*

This Illinois Central installation is not experimental. The equipment is standard Westinghouse railway air conditioning apparatus which was built only after successful laboratory and road tests had been completed.

Westinghouse provides the first and only system for railway air conditioning that is complete from rail to roof . . . all designed and guaranteed by a *single* manufacturer. It includes not only the air conditioning and refrigerating units but also the generating and controlling.

Westinghouse Air Conditioning equipment will fit any existing car without extensive alterations to the car structure. The entire system has been made extremely light-weight *without sacrificing the strength and ruggedness* necessary to withstand the severe shocks and stresses encountered in railway service . . . service under which ordinary equipment is expensive to maintain.

Your Westinghouse representative will be glad to help you arrange to inspect this equipment in service. For full information mail the coupon.

Westinghouse

Quality workmanship guarantees every Westinghouse product

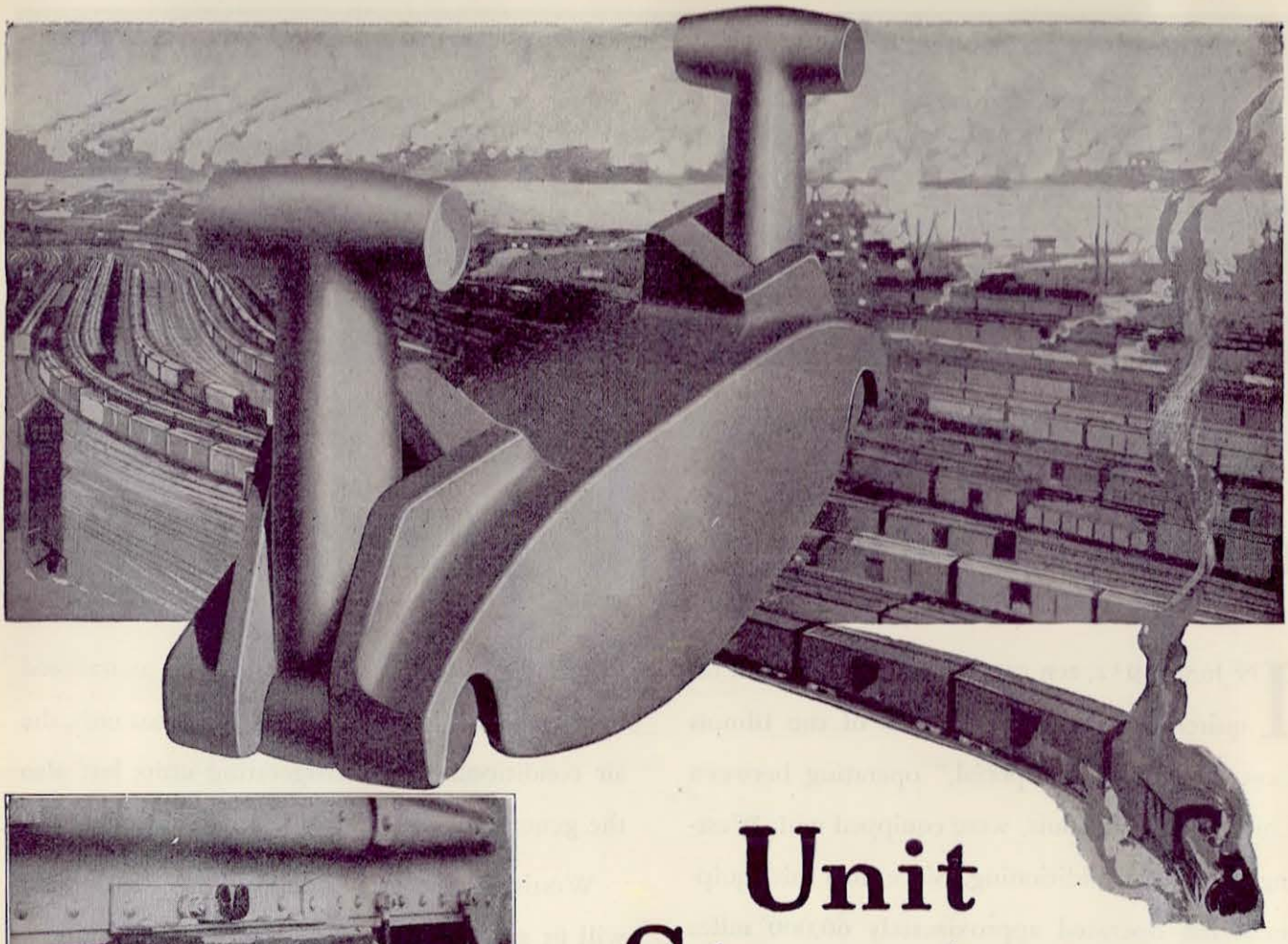
SEND FOR INFORMATION

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

Gentlemen:
Your descriptive literature on Railway Air Conditioning, please.

Name .....
Company .....
Address .....
City ..... *State* ..... RA 1-14-33

EQUIPMENT — FROM RAIL TO ROOF



Unit Structure

The striking casting has an integral bottom tie forming a unit structure in which is mounted the swinging Union Centering Device. Together they give the necessary movable coupler support with the solid center sill bottom tie.

UNION METAL PRODUCTS COMPANY

NEW YORK · CHICAGO · ST. LOUIS · WASHINGTON
RICHMOND · HOUSTON · SAN FRANCISCO · KANSAS CITY · MONTREAL

Dearborn Methods are

TIME-TESTED

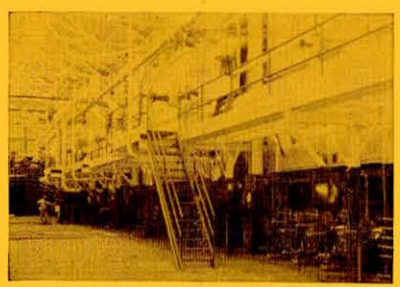
For almost a half century the Dearborn Chemical Company has specialized in the scientific treatment of water supplies for locomotive boilers, a service which has become world wide in scope.

RELIABLE

Proven effective correcting agents are employed, following analysis of the water supplies.

RESPONSIBLE

Dearborn service and laboratory control assure the maintenance of desired results at minimum cost.



Dearborn SEALING COMPOUND

Dearborn Sealing Compound applies easily and congeals into a tough, smooth, non-porous coat impervious to water.

Excellent for stationary boiler settings, in stopping infiltration; it is equally valuable in sealing cracked concrete walls, floors and reservoirs, keying to the surface of the concrete. Odorless, non-inflammable. Does not crack, become brittle or peel off. Also in building and repairing roofs, Dearborn Sealing Compound gives a durable seal.

Samples and recommendations sent gladly without charge.

A wealth of practical experience and laboratory research through nearly a half century form the foundation on which Dearborn Methods stand. Pioneers 45 years ago, the Dearborn Company leads today in the scientific handling of boiler water problems. Dearborn customers have been served continuously for ten, twenty, thirty and even forty years. Expressions of satisfaction with conditions maintained are daily recorded.

Whether the water supplies contain scale forming salts, are corrosive by nature, or show a tendency to foam, the situation is met by Dearborn Laboratories with materials in concentrated form requiring minimum quantities per thousand gallons of water consumed, to give desired reactions. Maximum economies are produced at lowest possible costs.

We offer this proven, economical service in solving your water problems.

Address us 310 South Michigan Avenue, Chicago; 205 East 42nd Street, New York; 2454 Dundas Street, West, Toronto.

DEARBORN CHEMICAL COMPANY

Crown Sheet Low Water Failures **82.5%** of All Fatal Accidents

As reported by Chief Inspector Bureau of Locomotive Inspection, I. C. C.

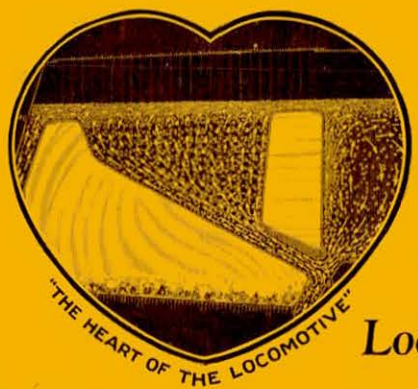
In the past four years 47 out of 57 fatal accidents due to failure of locomotive appurtenances have been caused by crown sheet failures due to low water.

Nicholson Thermic SYPHONS

would have prevented these disasters. SYPHONS are providing absolute safety from explosions due to low water on thousands of locomotives.

Rapid Circulation of Boiler Water

Savings in Locomotive Fuel



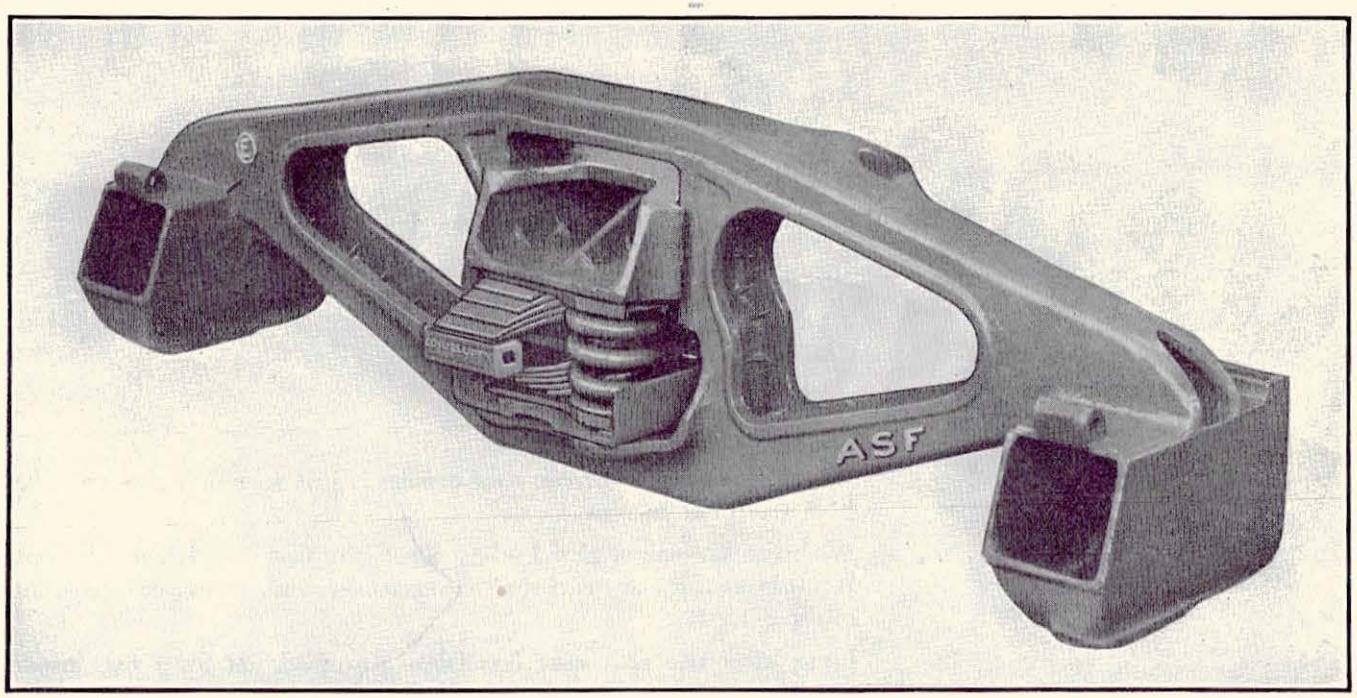
Increased Flue and Firebox Life

Improved Locomotive Efficiency

LOCOMOTIVE FIREBOX COMPANY
NEW YORK CHICAGO MONTREAL

PUTTING MEN TO WORK

Not in years have the railroads had such a wonderful opportunity to modernize their rolling stock at so low a cost as they have today.



The rehabilitation of obsolete freight cars originally equipped with arch bar or inferior designs of trucks by the substitution of Integral Box Cast Steel Side Frames with the coil elliptic spring grouping will produce improvements that are justified by savings even on the present scale of operation.

The saving in maintenance expense, and the saving account of fewer claims for damaged lading, will in a few years, repay the additional expense of applying modern trucks.

Further benefits result from the well known fact that every purchase of new material increases the amount of traffic available for the railroads.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

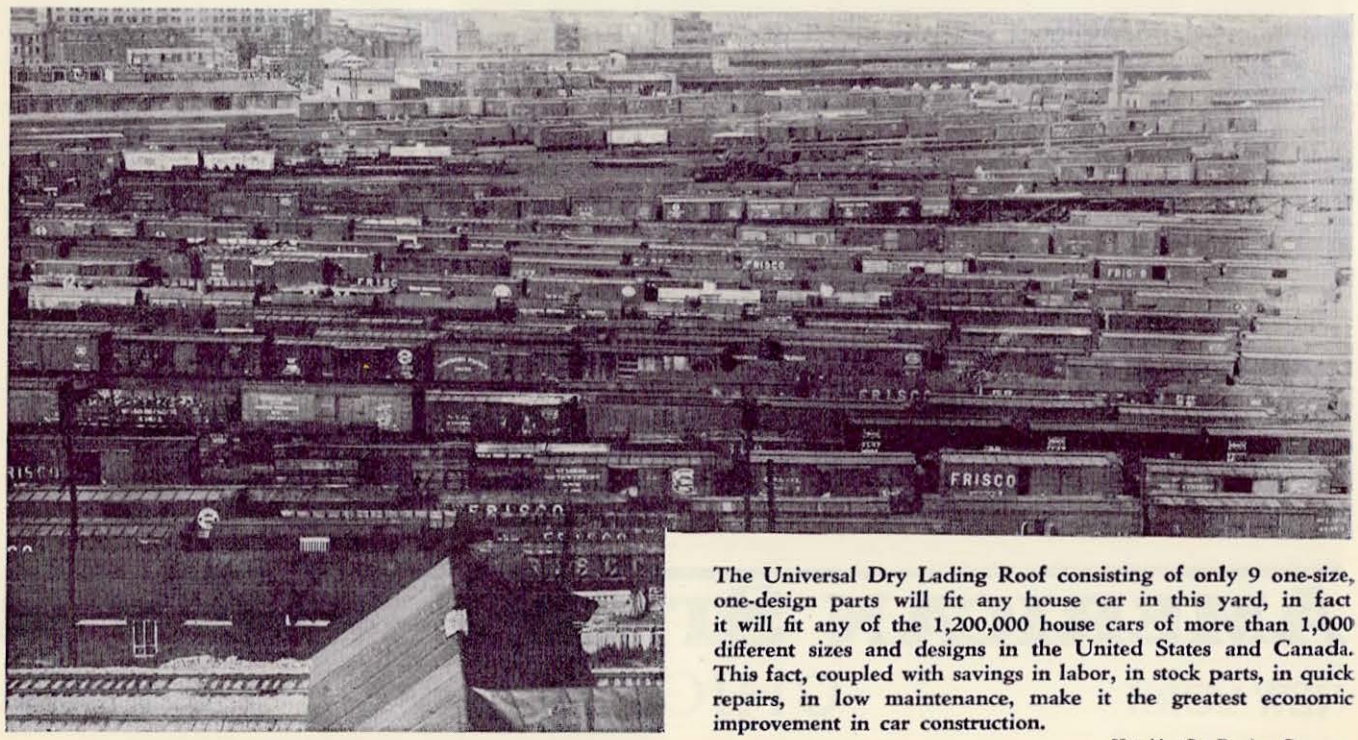
Where PROFITS depend upon EQUIPMENT—

MONEY spent for car roof repairs is just so much money taken from net income.

With the Universal Dry Lading Roof, the first cost is the last cost. It outlasts the car without maintenance, and outwears all other roofs 2 to 1.

Long after the first cost has been absorbed, its long life insures trouble-free service with no drain on profits through repairs, replacements, painting or other high maintenance charges.

For example, on one railroad the maintenance on 30,000 Dry Lading Roofs was only $4,519.49 for 18 years. Less than one cent per roof per year. Do you wonder why we say the Universal Dry Lading Roof will increase your profits?



The Universal Dry Lading Roof consisting of only 9 one-size, one-design parts will fit any house car in this yard, in fact it will fit any of the 1,200,000 house cars of more than 1,000 different sizes and designs in the United States and Canada. This fact, coupled with savings in labor, in stock parts, in quick repairs, in low maintenance, make it the greatest economic improvement in car construction.

Hutchins Car Roofing Company

RAILWAY AGE

Railway Management in 1933

One of the principal reasons why the present depression has been so prolonged has been that most persons for three years have been looking backward to the conditions and apparent prospects of the period which closed in 1929, instead of squarely facing the conditions of today and the prospects of tomorrow. Most persons overlook a change in the general trend of business until long after it has begun. There were numerous indications of a change in trend early in 1929, and even late in 1928; but they were generally overlooked or disregarded. There have been numerous evidences that a radical change in trend began late last summer; but because business has continued to be very bad most persons have overlooked these evidences or disregarded them. Failure to do all that is possible to expedite the improvement that is occurring, or to take advantage of it, will delay it, just as failure to make rapid adjustments to changes that were occurring in 1929, 1930 and 1931 helped to cause the depression and to prolong it.

Railways' Contribution to Business Improvement

No better evidence of the change in the trend of general business that began last summer could be afforded than the facts regarding railway freight traffic and earnings in the first eight months and in the last four months of 1932. In the first eight months of 1932 freight car loadings were 28 per cent less than in the first eight months of 1931. In the last four months of 1932 they were only 17 per cent less and in December only 9 per cent less. Statistics of railway earnings are available for only 11 months of 1932. In the first eight months of the year the total net operating income earned was $152,295,000, or 57 per cent less than in 1931, while in September, October and November it was $147,665,300, or only 5.6 per cent less than in 1931. The net operating income of the eastern lines in the first eight months of 1932 was 37 per cent less than in 1931, and in the three months ending with November almost 5 per cent greater. The net operating income of the southern lines in the first eight months of the year showed a reduction of 72 per cent, and in the three months ending with November an increase of 42 per cent. The net operating income of the western lines in the first eight months of the year showed a decline of 81 per cent, and in the three months ending with November a decline of only 23½ per cent.

Because of its importance, directly and indirectly, as an employer, and of the magnitude of its purchases of manufactured products and raw materials, the railway industry probably contributes as much toward depression or prosperity as any other American industry. The contrast between railway gross and net earnings in the first two-thirds and the last one-third of 1932 was principally due to an increase in freight business in the latter period, and very strikingly illustrates the advantage that the railways immediately derive from any improvement in general business. The problems of railway management are, therefore, not restricted to soliciting traffic for individual railway systems, and effecting retrenchments in their operating expenses. They include all the problems which must be solved to improve general business.

The railways actually began to contribute toward the improvement of general business as soon as their own business began to improve. For example, they employed 43,000 more men in October than in August. Furthermore, after having incurred a deficit, after operating expenses and fixed charges, of almost $174,000,000 in the first eight months of 1932, they earned net income in excess of fixed charges of $26,600,000 in September and October, which reduced the deficit previously incurred by them, and to that extent helped to strengthen the general security market. They have also increased their purchases since their business began to improve.

Every student of present business conditions knows that the principal thing needed to cause improvement to continue is for every business concern and person that can do so to increase employment and purchases. There are many concerns and persons which, because their incomes are still declining, are now being forced to retrench more severely than ever before. The improvement in general business that recently has been occurring, however, as demonstrated by such facts as we have given, show that, on the whole, employing and purchasing power is increasing, and it is essential to the most rapid practicable improvement in business that this increase in the power of employing and pur-

chasing shall be used to the utmost. The railroads, as a means of increasing their own earnings, should use to the limit all the increased employing and buying power that their improving earnings and credit may give them.

Helping to Reduce Taxes

The most outstanding and difficult of all the problems of this period of retrenchment is the problem of reducing excessive taxation and the excessive government expenditures that are responsible for it. This is a national problem, a state problem, and even more a local problem, because the bulk of the increase in taxation has been in local taxation. No industry, unless it be that of agriculture, has suffered more than the railroad industry from increases in local taxes. All over the country there are being organized associations for the reduction not of only national and state, but also of local, taxes. The railroads should actively participate in and help to finance this movement, because nothing is more essential to a revival of business than drastic reductions of taxes, and no industry, excepting perhaps agriculture, will benefit more, directly and indirectly, by the reduction of taxes than the railroads.

The Problems of Wages and Fair Legislation

One of the greatest problems with which railway managements are confronted is that of wages. The railways are receiving innumerable complaints that their passenger and freight rates are too high under existing conditions. Railway rates were not relatively as high during the recent period of prosperity as commodity prices, and, as business improves, commodity prices will advance. Therefore, there would be no justification for a demand that railway rates be made relatively as low now as prices have fallen. There is, however, no reason to believe that prices will advance to the level of 1923-29. Therefore, it is reasonably to be expected that there will continue to be pressure for reductions of railway rates. Furthermore, the railways are losing increasing amounts of traffic to competing carriers, partly because railway rates are too high as compared with those of competing carriers. The greatest obstacle to needed reductions of railway rates is that the railways are still paying wages that are 90 per cent as high as they were in 1930 and 1931. Because present railway wage scales are largely based on those fixed under government operation, and because great changes in railway operating conditions have occurred, existing wage scales are not only too high under present economic conditions, but contain serious inequalities as between different classes of employees. Railway managements, under the agreement recently made with the labor unions, will be free on June 15 to begin negotiations under the Railway Labor act for readjustments leading both to reductions and readjustments. Railway managements and employees should meet this problem in a spirit of co-operation and courage for the purpose of so settling it as to help the railways to recover their traffic, and thereby their earning, employing and purchasing capacity.

Great emphasis recently has been placed upon the necessity for withdrawing national and state government subsidies from the competitors of the railways and for equalizing the regulation applied to all carriers. Public sentiment is now more favorable to the railways than it ever has been, but the needed national and state legislation will not be secured without a struggle at Washington and at state capitals, and without an educational campaign that will convince the public, and keep it convinced, that the legislation sought by the railroads is in the public interest. A campaign such as is required will take brains and energy and cost money. Those who oppose the legislation sought by the railways have brains, energy and money, and they are using and will use them. The railways have a right to employ every legitimate means to further their legitimate interests, and it is their duty to their security owners and the public to do so. The contest is not, however, one which directly concerns only competing carriers. It is one which concerns, for example, manufacturers of buses and trucks, on the one hand, and manufacturers of railway equipment and supplies, on the other hand; and it will not be won by those who are primarily interested in the future of the railways unless they give as good backing to those who are fighting to restore the earning capacity of the railways as is given to those who are trying to ruin the railways.

Need for Unity of Policy and Action

The conditions with which the railways of the eastern, southern and western territories are confronted differ somewhat. In eleven months of 1932 the eastern lines earned net return at the annual rate of 1.72 per cent on property investment, the southern lines at the rate of 0.67 per cent, and the western lines at the rate of 0.77 per cent. The southern and western lines are confronted with a more serious agricultural condition than the eastern lines. The western lines are being especially affected by losses of traffic to the Panama canal route. The railroad problem, however, is a single problem, and its solution demands unity of policy and action. Regardless of present differences in their conditions and financial results, all of the railways are fighting to avoid either financial ruin under private ownership, or the adoption of government ownership. Therefore, competition between railways in the same territory, and differences in financial results mainly due to differences in territorial conditions, should be subordinated to the one great objective, of restoring the earning capacity of the entire industry. To their own officers the various railroad systems are individual entities; but to the public they are a single industry; and they will fall or rise together. Whether, to paraphrase a famous remark of Benjamin Franklin's, they will hang together or be hung separately, may be largely determined by their managements in 1933.

Railway Purchases and Business

Preliminary figures of railway purchases for 1932, compiled by the *Railway Age,* present some startling and highly significant facts about business and the railroads. These figures show that the railroads of the United States spent approximately $441,500,000 in the markets of the country for fuel and materials and supplies in 1932, exclusive of expenditures for locomotives and cars, for construction work performed under contract and for rent, heat, light, water, power and other miscellaneous services. They also show that railway purchases have been increasing steadily since June.

In 1931, corresponding railway purchases amounted to approximately $695,000,000. In 1930 they amounted to approximately $1,038,000,000. In 1929 they were $1,329,000,000, and in the five years from 1925 to 1929, inclusive, they averaged $1,389,000,000 per year. The money expended by the railroads for fuel and materials and supplies in 1932 was thus approximately $250,000,000, or 35 per cent less than was spent in 1931; approximately $600,000,000, or 57 per cent less than in 1930; approximately $885,000,000, or 67 per cent less than in 1929, and approximately $935,000,000, or 69 per cent less than the five-year average.

These figures present two very significant facts. In the first place, they show that the railroads are capable of spending when railway earnings are again restored. Secondly, they show that the railroads, in the blackest year which they ever faced, contributed $441,500,000 to the business of this country for purchases of fuel and materials and supplies alone. Despite the reduction in these purchases which has occurred, the railways are still buyers to the extent of more than $1,200,000 every day.

In 1932 the railroads spent over $150,000,000 with coal producers for fuel; approximately $32,000,000 with oil refiners for fuel oil and over $13,000,000 for lubricating and illuminating oils. Approximately $116,000,000 of their purchases represented iron and steel products, including more than $27,000,000 for track materials; $7,500,000 for telegraph, telephone and signaling materials; more than $17,000,000 for wheels, tires and axles, and more than $12,000,000 for locomotive and car castings. Their purchases also included expenditures of more than $50,000,000 for forest products, and of $8,000,000 for products of copper and brass; $5,000,000 for miscellaneous electrical supplies; $7,000,000 for restaurant supplies, and $11,000,000 for stationery.

In the light of purchases averaging $1,200,000 daily in such times as these, can anyone question the importance of the railroads to the business of this country? In further light of the fact that railway purchases averaged $3,800,000 daily from 1925 to 1929, can anyone question the present effect on business of this average daily loss of $2,600,000 in railway purchases, or its value to national prosperity if restored? Yet there are a great many people who appear to know very little about the railroads or they could not be indifferent to their plight and to the efforts of their managements to solve the problems of excessive taxation, restrictive regulation, and subsidized and unregulated competition. The magnitude of the purchases made by the railroads in 1932, when only the barest necessities were bought, shows that they are still one of the most important customers of our basic industries. The additional purchasing power which will be created when railway earnings improve should make every citizen consider the railroad problem as his own problem, whose solution will prove the most rapid and effective method of restoring business in general.

"It is true that trucks and other motor vehicles do pay a considerable part of the cost of the highways. Nevertheless, it is only a part, and is far short of covering total highway expenditures, the remainder of which fall upon property owners and the other tax-payers, either directly or through bond issues.

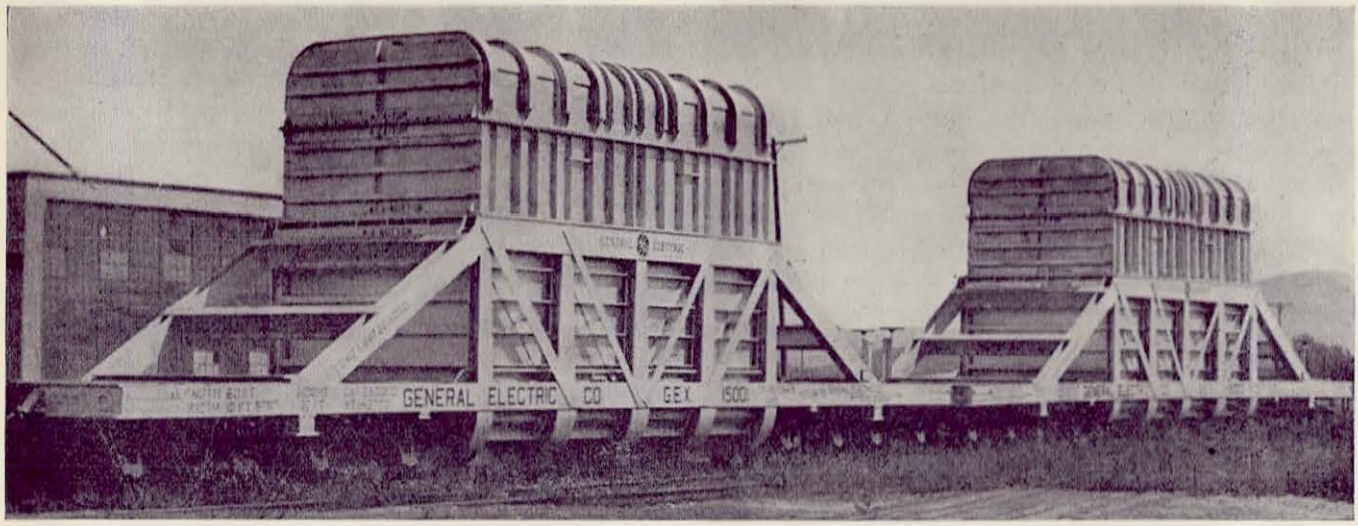
"Whatever views may be held as to the operation of passenger automobiles, which represent a communal use in which substantially the entire population participates, the use of the highways by commercial vehicles is in a very different category. The payments made on behalf of such vehicles are not, properly speaking, taxes at all in the sound meaning of that term. They are actually rentals for the use of the publicly owned roads as places to carry on private business for profit.

"If motor vehicles as a whole are paying only one-third of the total highway costs, the conclusion seems inescapable that trucks must be paying measurably less than one-third of what their contribution should be to constitute a compensatory rental. Hence, unless the highway rentals paid by trucks are raised to the point where they shall be fully compensatory, and levies in addition thereto made for the benefit of the public treasury, it cannot correctly be said that trucks are paying taxes at all. They are merely paying deficient rentals for the use of the highways, and the amount of the deficiency, plus the exemption from real taxation, constitutes the subsidy which truck transportation enjoys.

"A tax is defined as 'an enforced contribution levied upon persons, property or income . . . for the support of government.' The taxes paid by the railroads are real taxes, under this correct definition, because they are all devoted to the support of government. The rentals paid by trucks, on the other hand, do not go to the general support of the government but are put back into the maintenance and improvement of the highways which the trucks themselves use.

"In the country as a whole there are about 2,200,000 freight cars, as against nearly 3,500,000 motor trucks. I ask you to consider this question. Even if it were true that the so-called taxes now paid by motor trucks were real taxes (which I respectfully submit is demonstrably not the case), what logic is there in the contention that railroads operating 2,200,000 freight cars on rights-of-way which they own and maintain at their own expense, should not pay materially less taxes than three and one-half million motor trucks operating on highways built and owned by the public?"

—From a letter of a railroad officer to a prominent business man, identified with highway transport.



Two Special Transformer Cars Built by the General Electric Company at Schenectady, N. Y.

All-Welded Cars for Transporting Transformers

General Electric meets special transportation problem by designing two cars of 260,000 lb. capacity for hauling eight transformers weighing over 200,000 lb. each

By Oscar M. Bloch

Engineer, Traffic Department, General Electric Company, Schenectady, N. Y.

TWO special transformer cars, built recently by the Schenectady, N. Y., works of the General Electric Company, are believed to be the first railroad equipment of such large capacity to be completely built by electric-arc welding and to be the first completely arc-welded freight cars accepted by the railroads for interchange service. Each car, except for trucks and span bolsters, is of arc-welded construction throughout, and the contained load is carried in a gas-tight tank which is part of the car structure. Each car weighs 142,700 lb. and the capacity is 260,000 lb., giving a weight on the rails of 402,700 lb.

General Electric engineers have designed, and the company has received an order for eight transformers, the dimensions and weights of which far exceed any heretofore constructed. The core and coils alone of each of the four heaviest units weigh 200,000 lb. They form the largest and heaviest piece of each machine and must be shipped assembled. This part of the machine must be kept at all times absolutely free from moisture and must be moved in a container that is absolutely air-tight.

Car Designed to Suit Transformers

The actual dimensions of these transformers were governed to a large extent by the facilities that could be provided for shipping the largest and heaviest single part; namely, the assembled core and coils. It was found that no existing freight cars of any type could carry the required loads at the clearance available. For that reason, it became necessary to design special cars. It was decided to employ welded construction, which has many advantages over riveted construction with regard to saving in weight, cost, clearance (on account of rivet heads) and finally with regard to the strength, rigidity and resistance to impact of the resulting structure.

The clearance limits over the route to be followed by these loads are as follows:

8 ft. 3 in. wide at 17 ft. 0 in. above the rail.
10 ft. 6 in. wide at 15 ft. 6 in. above the rail.
10 ft. 6 in. wide at 2 ft. 10 in. above the rail.
6 ft. 11½ in. wide at 0 ft. 6 in. above the rail.

The limiting weight on the rail for an eight-axle car was assumed as about 400,000 lb., giving a load per axle of car and lading of about 50,000 lb. The nominal journal capacity for an eight-axle car with 6-in. by 11-in. journals is 420,000 lb., giving a load of 52,500 lb. per axle, so that 96.5 per cent of the actual journal capacity available is utilized. However, many existing track and bridge structures are not strong enough to enable such loads to be moved over them.

Therefore, to secure the maximum operating radius possible the limiting weight on the rail was restricted to what experience has shown to be a proper figure; namely, 400,000 lb. Even at this figure, circuitous routing to avoid certain track or bridge structures becomes necessary in many cases, and in other cases speed restrictions —slow movement over other structures—must be employed.

In order to meet industrial-track curve conditions, the car was designed to operate over curves having a mini-

mum radius of 120 ft. The buffing force, that is, the force with which cars come together in yard movements, switching coupling, etc., was set at 500,000 lb. The maximum deflection under load at the center line of the car was set at 1 in., and maximum spring travel at 1 in., to eliminate excessive springing motion of the car body under load.

A tank-type car, having a gas-tight tank built into the car structure, was designed for a load of 260,000 lb. concentrated over 18 ft. of the center of the tank or well. The core and coils are completely enclosed within the tank, and the tank is filled with gas at a pressure of 5 lb. per sq. in. to exclude moisture. Inlet and outlet valves are provided on the tank and extra gas reservoirs may be carried on the car during transit to make up any small gas losses that may occur. Fastening devices are also provided to hold the core and coils rigidly in place during shipment.

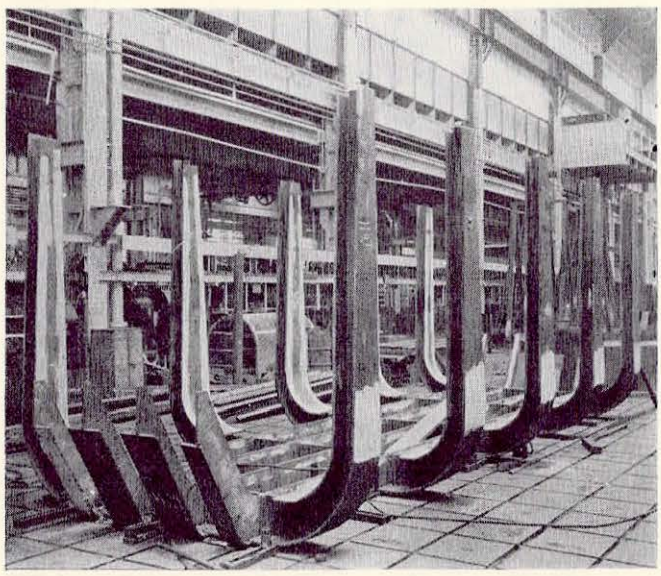
Car Construction

The main car frame consists of two Pratt trusses, with the bottom chords extending the full length of the car between the end sills, and the inclined portions of the top chords (end posts) intersecting the bottom chord at the center plates where the reactions due to load are applied.

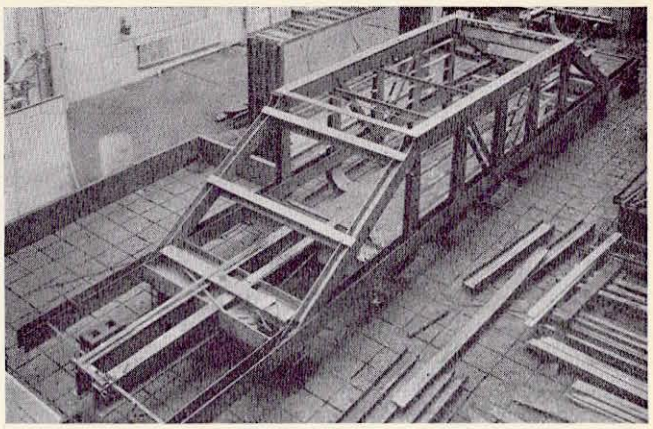
The verticals are U-shaped members of I-section, having a depth of 7 in. in the portions which form the truss verticals, increasing to a depth of 12 in. at the center line of the car under the load. They are continuous across the car between the main trusses and serve to transfer the reactions of the longitudinal floor members up into the main trusses and to connect the main trusses together.

Longitudinal members under the tank floor run between the transverse horizontal portion of the U-shaped members and frame into them. The tank floor proper is a continuous plate, 1 in. thick, running between the cross beams. This plate forms the top flanges of the horizontal portions of the U members and of the longitudinal members in the tank floor. Locating members to anchor the core and coils to the floor are welded to this plate.

The center sills run from the striking castings at the outer ends of the car through the body bolster and are continuous to the inner cross beams. The cross beams of the body bolster are designed to transmit the buff of 500,000 lb. to the bottom chords of the truss, which are



Center Portion of the Fabricated Frame of One of the All-Welded Transformer Cars



Frame Construction of the General Electric Tank-Type Transformer Car

designed to take the buff, but it is apparent that this force (500,000 lb.) is taken through the entire floor system of the car since the center sills are in contact with the longitudinal floor beams. This gives a large margin of safety against impact, over and above that allowed in design. The center plate is welded to the bottom flange of the bolster cross beam.

The intermediate, or collar, section and the top, or cover, section are shown in the illustration of the two cars. They are bolted on top of the main tank with a cork gasket at the joints. The clear dimensions inside the tank with these sections in place are: Length, 21 ft. 6 in.; width, 8 ft. 10½ in., and height, 14 ft. 11½ in.

Two considerations govern the design of such a heavy-capacity freight car. The light weight of the car must be kept as low as possible and the deflection of the car under load must be minimized. This led to the adoption of a Pratt truss for the frame, as a truss gives the lightest structure for the given load, height and span. Furthermore, as the diagonal members of a Pratt truss are in tension, they are lighter than corresponding members in compression. All sections, except the cross beams, are built up of plates welded together, because the cross section of the members can be varied to suit the load, resulting in considerable weight saving.

The stress calculations for the truss members are made in the same manner as for any similar truss. All, except those due to gas pressure inside the tank, have been increased 20 per cent for impact. Stresses in the body bolsters and center sills were calculated by the usual methods. The bottom chord is designed to take the full buff, acting as a column between the draft-gear back stops.

The tank lining is made of $\frac{3}{16}$-in. plate with horizontal stiffeners of ½-in. by 4-in. plate welded to the truss verticals on 16-in. centers. This was found to give the lightest construction without excessive plate distortion under gas pressure.

It was necessary to take care of the gas pressure inside the tank without taking any of it on the top and bottom chords. This was accomplished by designing the vertical portions of the U-shaped members to act as cantilevers fixed at the base. When the collar and cover sections are bolted in place and the whole structure acts as a unit, the deflection at any point due to gas pressure is very small.

The joints can be brought up to the rest of the car by merely adding additional welding on the various members as is necessary. In this way the full journal capacity of the car can be utilized if other limiting factors permit. Welded construction alone permits such a reserve capacity in design at nominal expense. In this

case, the welding at the joints is continuous. The necessary extra welding is already applied and the car as a whole, while originally intended for a load of 260,000 lb., can be utilized for a maximum possible load of 315,000 lb.

Cost of Construction

The costs shown for the drop-frame car are actual bids from representative car builders. The cost of the tank type car is the shop estimate for building this car in one of the company's plants.

	Estimated car weight	Cost
Drop-Frame Car		
Cast steel	151,000 lb.	$17,000
Welded	148,000 lb.	15,600
Tank-Type Car		
Cast steel	175,000 lb.	(Not figured on account excess weight)
Welded (actual weight, 142,700 lb.)	135,000 lb.	$15,000
Riveted	150,000 lb.	17,500

The comparison for the drop-frame car shows the welded car to be the most economical. For the tank-type car, it is plain that the welded car offers the only satisfactory solution of the problem, as the car weight for this type is less than that of either the cast-steel or riveted car. In a car of this capacity (which is about the limit of possible loads, all factors considered) every pound added to the car weight becomes of vital importance, far more so than is the case with cars carrying much lighter loads.

The extra clearance secured by eliminating the protruding rivet heads is also of vital importance, as the dimensions of large machines make it difficult to secure sufficient room for structural members within clearance lines and still leave the necessary clear dimensions inside the car for the piece to be shipped. In this case every half inch counts.

The cars have been accepted for interchange railroad service on the basis of the design here presented. Savings as indicated for this car are: Car weight, 9 per cent, and cost, 13 per cent.

As experience accumulates and construction methods have become standardized, these percentages should increase. If the saving in car weight alone be applied to freight-car equipment generally, the saving to the railroads by reason of lessened weight of trains and, therefore, of decreased train hauling costs would reach a large figure.

Competition between rail and motor transport in Sweden is attracting more and more attention, says the Department of Commerce. Notwithstanding the fact that motor vehicles may act as auxiliaries to railroads and, in fact, are largely used as such, it is said that long hauls of goods on motor trucks are reducing the income of the railroads, particularly at the present time when the gross income of the railroads has been materially lessened. It has been recommended that stricter regulations should be applied to motor truck traffic with reference to the number of concessions granted, maximum loads, maximum load pressure per wheel, maximum and minimum tariffs, etc., and also that restriction be placed on private motor omnibus traffic in competition with the municipal street car lines in Goteborg. It is reported that certain motor truck owners are taking the matter into their own hands, organizing cartels to prevent keen competition and maintain fixed tariffs, and that in several cities in Southern Sweden motor vehicle owners have formed an association, each member of which is required to deposit Kr. 500 ($134) or security for a corresponding amount, which will be forefeited to the association if a lower tariff is offered than that required by the association.

Five Roads Protest Against Cumberland River Expenditures

FIVE railroads, the Nashville, Chattanooga & St. Louis; the Louisville & Nashville; the Illinois Central; the Tennessee Central and the Gulf, Mobile and Northern, have filed a protest with the Board of Engineers for Rivers and Harbors of the War Department, against the further expenditure of federal funds on the Cumberland river. The protest, which follows a survey made by the United States district engineer at Nashville, Tenn., of the Cumberland river and its tributaries at a cost of $250,000, and his recommendation that the federal government immediately spend $850,000 to improve the Cumberland river for navigation purposes, contends that:

1. The federal government was not created to engage in private business, whether it be transportation, power, or otherwise.
2. To spend the taxpayers' money to improve inland waterways for transportation and permit users thereof to take advantage of the same without paying compensation for the use of public property for private gain is not only economically unjustifiable but violates that fundamental principle of our government that there will be "special privileges to none."
3. We have now an over-supply of transportation and power facilities. To develop more of either at the present time would be an inexcusable economic waste imposing an unnecessary and unjustifiable tax burden on the already long-suffering taxpayer.
4. This country produces each year a certain amount of surplus wealth for reinvestment. An ever-increasing proportion of such surplus is being put in non-taxable properties, such as highways, highway bridges and inland waterways. For many years this country has been taking out of its taxpaying wealth some two billions of dollars annually for investment in non-taxable properties, such as highways, bridges, locks and dams. There is not enough wealth in this country to continue that absurd economic policy much longer. If there is to be property which can produce taxes to run the government, then the surplus wealth of the country must stop being poured into tax-exempt schemes and put into productive, job-giving, taxpaying activities. The policy of the federal government—and the several states as well—in recent years is utterly destructive of any sound economic system.
5. In its final analysis it seems to us evident that practically every dollar heretofore expended on the Cumberland river has been a useless waste of public funds and that any further expenditure would be merely an additional waste of the taxpayers' money either for the benefit of none at all or for the benefit of a special and privileged few.

These contentions are supported by evidence which shows that there has been no general traffic on the river for a decade, the little moving being local and made up almost entirely of sand, gravel and lumber; that notwithstanding the fact that the federal government expended, up to June 30, 1931, $11,333,540 on the river for navigation purposes, river traffic decreased; and that the report does not indicate that the expenditures will create any new traffic. In addition the protest attacks the suggestion that the expenditure of $100,000,000 to develop navigation, flood control and power development is in the public interest on the grounds that existing plants and facilities, financed by private capital, are now prepared to develop electrical energy for years to come and that if additional electrical energy may be needed places other than those on the Cumberland would normally be developed.

"In general," the protest continues, "large expenditures on the Cumberland river have not resulted in substantial movements of commercial freight. River tonnage below Nashville for 1930, amounting to 429,792 tons, included 153,967 tons of gravel, 88,456 tons of sand, 132,255 tons of stone, 21,138 tons of logs, 1,787 tons of lumber, 45,738 tons of crossties and 6,451 tons of all other materials.

"The character of this tonnage is illuminating. More than half, 241,423 tons, consists of sand and gravel, almost all of which is dredged from the river itself and floated a short distance to market. In 1929, for example, the tonnage through Lock No. 1, just below Nashville Wharf, was reported as 14,456 tons. The next year it increased to 129,038 tons. 'The increase. . . . is accounted for by the renewal of sand and gravel operations in this section,' says the report of the United States chief of engineers. In other words, more than one-fourth of all the 'freight' moving on the river seems to have been sand and gravel moving through this one lock and over the short stretch of river up to the landing.

"The 1930 total tonnage was 37 per cent more than that of 1929. All of this increase, and more, was in non-metallic minerals, mostly sand and gravel, which showed an increase of 57 per cent. All other classes of freight decreased, as follows: Vegetable food products, 79 per cent; wood and paper, 19 per cent; ores and metals, 28 per cent; machinery and vehicles, 65 per cent; and unclassified, 73 per cent.

"It is now urged that this lack of tonnage does not indicate that all the years of effort and millions of tax money spent on this project have been wasted, but that we just haven't done quite enough. We should, it is proposed, immediately deepen the channel at a cost of nearly another million dollars; and should look forward to the time when we shall enlarge and double the locks, at what will probably be a still larger additional cost. The argument is curiously familiar. Each step of the long road of the improvement of the Cumberland, and the creation of the Nashville river terminals, has been urged as the one that would bring about a new transportation era in Middle Tennessee—just another half million dollars here, and another one there, and everything will come out all right."

Reduced Inventories Make Room for New Materials

Statistics show improved condition on all roads, despite heavy stocks of old material and scrap

DRASTICALLY-REDUCED railway operations and the postponement of projects for which materials have been purchased have complicated the supply work on railroads. The problem has been further enlarged by the impracticability under prevailing conditions of disposing of increasing accumulations of old materials. Despite these and other difficulties, the railroads have again succeeded in cutting down their piles of unapplied materials by substantial amounts in practically all parts of the country. The progress made up to October 31, 1932, was shown in some detail in the issue of *Railway Age* of January 7 and can now be further illustrated with the accompanying charts and preliminary figures which some roads have released for publication.

Purchases and Inventories of Representative Railroads—1932#

Road	Purchases 10 Months 1932	On Hand October 31, 1932	On Hand January 1, 1932
Alton	$1,921,135	$768,176	$864,634
Atlanta, Birmingham & Coast	454,828		
Atchison, Topeka & Santa Fe	15,192,763	13,282,362	15,249,977
Baltimore & Ohio	8,967,617		15,081,656
Bangor & Aroostook	1,019,327	952,221	1,003,471
Belt Railway of Chicago	509,263	232,741	298,261
Boston & Albany	3,050,607	1,380,588	1,650,759
Boston & Maine	6,071,917	5,210,402	5,104,030
Central of Georgia	1,268,682	813,888	1,137,720
Central of New Jersey	3,614,654	2,077,200	2,390,603
Central Vermont	934,138	487,426	586,947
Chesapeake & Ohio	6,640,337	5,274,185	6,097,580
Chicago & Eastern Illinois	1,369,215	735,256	958,584
Chicago & Illinois Midland	250,109	216,453	223,761
Chicago & North Western	9,795,327	7,892,045	9,997,460
Chicago & Western Indiana	433,747	324,909	
Chicago, Burlington & Quincy	8,818,743	8,050,385	10,391,137
Chicago Great Western	2,518,144	946,308	952,421
Chicago, Mil., St. P. & Pacific	12,742,668	8,813,500	9,987,833
Chicago, Rock Island & Pacific	7,951,404	6,273,156	7,017,831
Chicago, St. P., Minn. & Omaha	2,488,585	948,930	1,240,934
Clinchfield	493,130	332,864	674,219
Columbus & Greenville	153,985	118,359	126,166
Delaware & Hudson	4,349,599		
Delaware, Lackawanna & Western	5,303,395*		
Denver & Rio Grande Western	2,316,566	2,298,715	2,635,056
Detroit, Toledo & Ironton	305,338	548,554	703,362
Erie	10,510,920	3,018,659	3,856,400
Florida East Coast	747,022	1,464,187	1,485,600
Great Northern	8,513,199		
Gulf Coast Lines	2,219,740	2,495,145	2,599,072
Illinois Central	11,632,817	7,638,047	7,911,696
Kansas City Southern	1,168,131	1,457,787	1,573,897
Lake Superior & Ishpeming	27,907	201,954	250,156
Lehigh & New England	301,866*	357,653‡	355,502
Louisiana & Arkansas	343,825	481,210	599,531
Louisville & Nashville	$7,376,919	$8,266,236	$9,155,603
Minneapolis & St. Louis	988,757	825,843	994,585
Minneapolis, St. P. & Sault Ste. Marie	3,458,170	2,631,856	3,213,459
Missouri & North Arkansas	161,029	129,619	
Missouri-Kansas-Texas	2,256,255	3,096,176	
Missouri Pacific	8,912,009	6,228,404	7,422,125
Mobile & Ohio	1,006,109	500,586	546,232
Montour	194,492	170,850	152,932
Nashville, Chattanooga & St. Louis	1,607,665	1,315,585	
New York Central	31,020,187	31,322,652	35,126,991
New York, Chicago & St. Louis	4,093,530	2,402,173	2,823,255
New York, New Haven & Hartford	5,291,401	6,600,918	7,840,657
Northern Pacific	7,306,353	6,771,832	10,260,590
Northwestern Pacific	325,414	553,258	559,578
Pere Marquette	1,994,471	1,597,867	2,025,135
Pittsburg & Shawmut	111,871†	104,061	98,386
Pittsburgh & West Virginia	147,452	104,630	151,171
Pittsburg, Shawmut & Northern	135,144	124,237	140,153
Reading	5,905,344		
Rutland	613,250*	482,308‡	547,532
St. Louis-San Francisco	4,673,228	3,205,143	3,879,814
St. Louis Southwestern	1,023,815	2,889,732	3,248,915
Seaboard Air Line	3,874,003	2,716,611	3,651,120
Southern	11,219,887	5,717,997	6,411,724
Southern Pacific, Pac. Sys.	11,086,703	14,500,494	15,357,141
Spokane, Portland & Seattle	607,490	304,691	358,821
Tennessee Central	200,386	200,885	245,484
Texas & New Orleans	3,054,755	4,769,999	5,676,444
Texas & Pacific	2,068,934	3,044,299	3,522,571
Union Pacific Lines	15,595,114	13,829,638	15,269,099
Wabash	4,289,336	3,096,778	4,080,775
Western Maryland	1,592,125	1,436,401	1,728,549
Western Pacific	1,502,955	1,894,900	2,097,905
Wheeling & Lake Erie	620,099	663,218	752,313

* Purchases for nine months.
‡ Month of September.
† Purchases for eight months.
# Subject to revision.

These figures can be taken as representative of the progress made in 1932, pending the compilation of complete figures for all the roads for the 12 months.

As shown in the January 7 issue, the amount of money tied up in unapplied materials on the railroads on October 31, was less than in January, 1932, in the estimated amount of $40,000,000, representing a reduction of approximately $3,000,000 in stocks of coal, $14,700,000 in ties, and $22,300,000 in miscellaneous materials, a reduction which gives the railroads the smallest inventory in the aggregate since 1916.

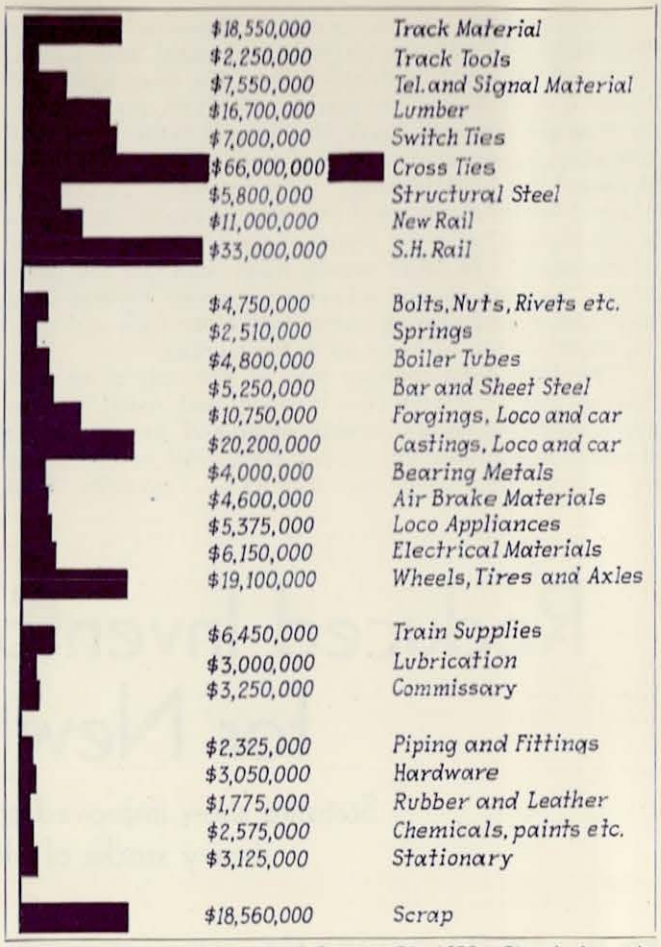
Large Reductions Common

It is significant of the strenuous efforts made to reduce railroad stocks in line with reduced operations, however, that all but 4 of 65 roads for which comparable records have been gathered reported reductions in their stocks ranging from 5 per cent to 24 per cent. The reduction in the amount of fuel and other supplies on hand on the Sante Fe appears to have been almost $2,000,000, or 12.8 per cent. There were reductions on the C. & N. W. and the C. B. & Q., respectively, amounting to $2,055,000, or 20 per cent, and $2,340,000, or 22 per cent. In contrast with January, October inventories were approximately $1,034,000, or 10.4 per cent, lower on the C. M. St. P. & P.; $744,000, or 10.6 per cent, on the C. R. I. & P.; $837,000, or 21.9 per cent on the Erie; $889,000, or 9.7 per cent, on the L. & N.; $1,193,000, or 16.1 per cent, on the M. P.; $3,824,000, or 10 per cent, on the N. Y. C. lines; $1,239,000, or 15 per cent, on the N. Y. N. H. & H.; and $1,439,000, or 9 per cent, on the U. P.

Materials and Supplies on Hand—Class I Railroads, October 31, 1932*

Frogs, switches, crossings and parts	$8,900,000
Track bolts, spikes, etc.	9,650,000
Track tools and supplies	2,250,000
Interlocking, signal, telegraph and telephone material	7,550,000
Cement, cast pipe, roofing, etc.	1,950,000
Bridge and building lumber	10,200,000
Switch ties	17,000,000
Cross ties	66,000,000
Iron bridges and structural steel	5,800,000
Rail, new and second-hand	44,000,000
Water and fuel handling and work equip. materials	3,200,000
Total M. of W. and S.	$176,500,000
Bolts, nuts, washers, etc.	$4,750,000
Springs, car and locomotive	2,510,000
Boiler tubes, dry pipes, etc.	4,800,000
Tubing and soft metals	675,000
Bar and sheet steel	5,250,000
Forgings, locomotive and car	10,750,000
Castings, locomotive and car	20,200,000
Brass castings and bearings	3,250,000
Air-brake material, ex. hose	4,600,000
Locomotive appliances	5,375,000
Passenger-car trimmings	205,000
Electrical materials	6,150,000
Shop fuel	750,000
Foundry supplies	325,000
Wheels, tires, axles	19,100,000
Lumber for cars and locomotives	6,500,000
Machinery, boilers, trucks and other materials	400,000
Total M. of E.	$95,590,000
Train and station supplies, grain doors, etc.	$6,450,000
Lubricating and illuminating oils, packing, etc.	3,000,000
Fuel for locomotives, stations and cars	18,200,000
Commissary supplies	3,250,000
Total Transportation	$30,900,000
Piping and fittings	$2,325,000
Hand tools and hardware	3,050,000
Rubber and leather	1,775,000
Glass, chemicals, paint supplies, etc.	2,575,000
Stationery and printing	3,125,000
Scrap	18,560,000
Common to All Departments	$31,410,000
Grand Total	$334,400,000

* Estimated by the *Railway Age* on the basis of reports from representative roads.



Materials and Supplies on Hand October 31, 1932—Classified on the Basis of Reports from Representative Roads

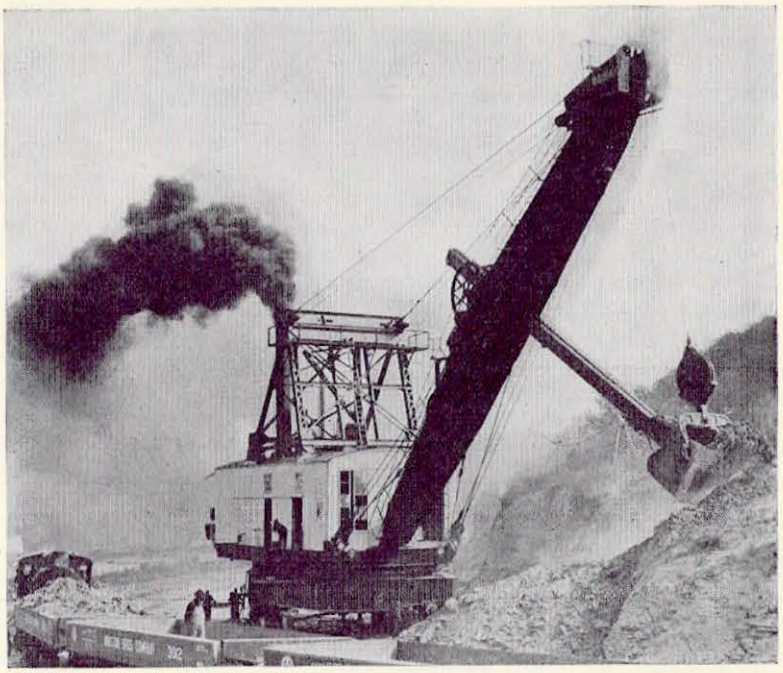
Based on the study of the classified reports of several roads, the bulk of materials and supplies on hand on October 31, was carried for the use of the maintenance of way and construction department, consisting of materials valued in the estimated amount of $176,500,000, of which approximately $18,000,000 was in track fastenings and parts, $66,000,000 in ties, and $44,000,000 in new and second-hand rail. The inventories also included about $95,000,000 in mechanical-department materials, including approximately $10,000,000 of locomotive and car forgings and $20,000,000 of locomotive and car castings. In addition, the railroads appear to have had unsold scrap on hand in October in the estimated amount of over $18,000,000 which, at prevailing prices, represents an unusually large tonnage.

While comparisons between the purchases made in 1932 and the value of supplies on hand suggest oversupplies of material, indications point to the fact that this over-supply is more imaginary than real, except in special cases. A considerable percentage of the materials on hand at present consists of fixed or stand-by stocks which must be kept under all conditions for the protection of operations, such stocks amounting to 25 per cent of the maintenance of way materials on one road. Inventories also include much obsolete material and considerable amounts of serviceable stock for which there is no present demand. The reductions which have been made in the materials and supplies, considering the inclusion of such stocks, emphasize the extremities to which some roads have gone in reducing the reserve stocks of supplies required for routine operations and the increased dependence of the railroads upon purchases for the materials required for maintenance and operations.

These reductions for the most part were based on the book value of fuel and materials and supplies, exclusive of scrap, and are influenced only to a slight extent in the aggregate by differences in the prices paid in the two periods compared.

Jetting Solidifies Large Embankment

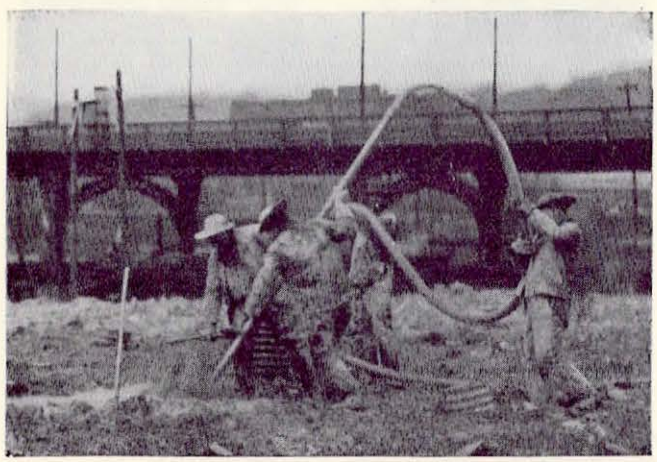
The method employed on the Cincinnati Union Terminal project after a thorough study of filling material proved highly successful



The Large Volume of Shale Removed from Bald Knob Warranted a Thorough Study of its Behavior as a Filling Material

ONE of the most comprehensive projects ever undertaken for accelerating the settlement of an embankment has been carried out at Cincinnati in connection with one of the largest grading jobs of recent years—the filling in of Mill Creek Valley for the site for the new Cincinnati Union Terminal facilities. Of further interest is the scientific study of the composition and structure of the filling material that was undertaken when the behavior of the fill was under consideration, and which exerted a definite influence in the selection of the particular means adopted to accelerate solidification.

The preparation of the terminal site, including the construction of railway facilities to take the place of certain yards, freight stations, etc., that had to be removed from the terminal area, required the placing of about six million cubic yards of fill—an amount so large that the discovery and acquisition of an adequate source of supply was a problem of no small magnitude in itself. As a result, when a survey of suitable supplies of material led to the consideration of Bald Knob, which afforded a volume of material in excess of the requirements with a haul of not to exceed three miles, much of it downhill, to any part of the terminal area, this eminence on the west side of Mill Creek valley was purchased. The fact that the character of the material, Eden and Fairview shales broken by thin beds of limestone, would not be subject to rapid solidification, was recognized in the perfecting of arrangements to secure about 1,500,000 cu. yd. of sand and gravel from a pit about 16 miles from the terminal for use in locations where prolonged settlement would have been especially objectionable. However, the fact that the construction schedule allowed a settlement period of two years or more (between the placing of the fill and the date for active use) for a large part of the terminal area was deemed an adequate answer to any apprehension concerning the use of the Bald Knob shales.



The Solution—Jetting the Fill

Drought Intensifies Problem

The material proved thoroughly satisfactory for a large part of the area to be filled, but two unforeseen contingencies pointed to the need of further measures to accelerate the rate of solidification. In the first place the bulk of the fill was placed during two years of exceptionally small rainfall, so that the moisture necessary for compacting of the shale was not supplied. In the second place the construction schedule was shortened by an amount which, while not great considering the construction period as a whole, resulted in an appreciable decrease in the time allowed for the solidification of the material placed last. Further than this, there were places where the area to be filled, was of exceedingly irregular contour because of its previous use as a dumping ground, with the result that there were marked differences in the depth of fill in relatively short distances. This, naturally, would exaggerate the effect of settlement. There were also the potential economies in maintenance to be derived as a result of thorough solidification in advance of use.

As a result of these considerations it was decided to make a thorough study of the filling material taken from Bald Knob, supplementing such facts as had been learned from periodic settlement levels that had been taken on completed portions of the fill, to the end of determining what practical means could be adopted for accelerating the solidification. An important feature of this investigation was a study of the composition and structure of the shale which, with a material of so finely divided a state as a shale, presented a task of more than ordinary difficulty. Seventy-three per cent of the constituent particles were found to be less than 0.0008 of an inch in diameter while 49 per cent are less than 0.0001 inch. Based on the criterion of size, 21 per cent of the material is colloidal.

Ordinary methods of minerological identification and quantitative analysis being precluded, it was necessary to start with a chemical analysis, which disclosed the presence of the oxides of six elements in varying proportions and with this information and a study of individual particles under the microscope, to determine what minerals and what proportion of each would fit the data at hand. This resulted in the following conclusion as to the minerological composition. The table gives also the hardness and specific gravity of each of the minerals.

Mineral	Per Cent	Hardness	Specific Gravity
Kaolinite	75	2	2.46
Iron pyrites	0.5	6.5	5.0
Limonite	6	1	3.5
Dolomite	7	3.5	2.9
Talc	6	2.0	2.7
Quartz	6	7	2.65

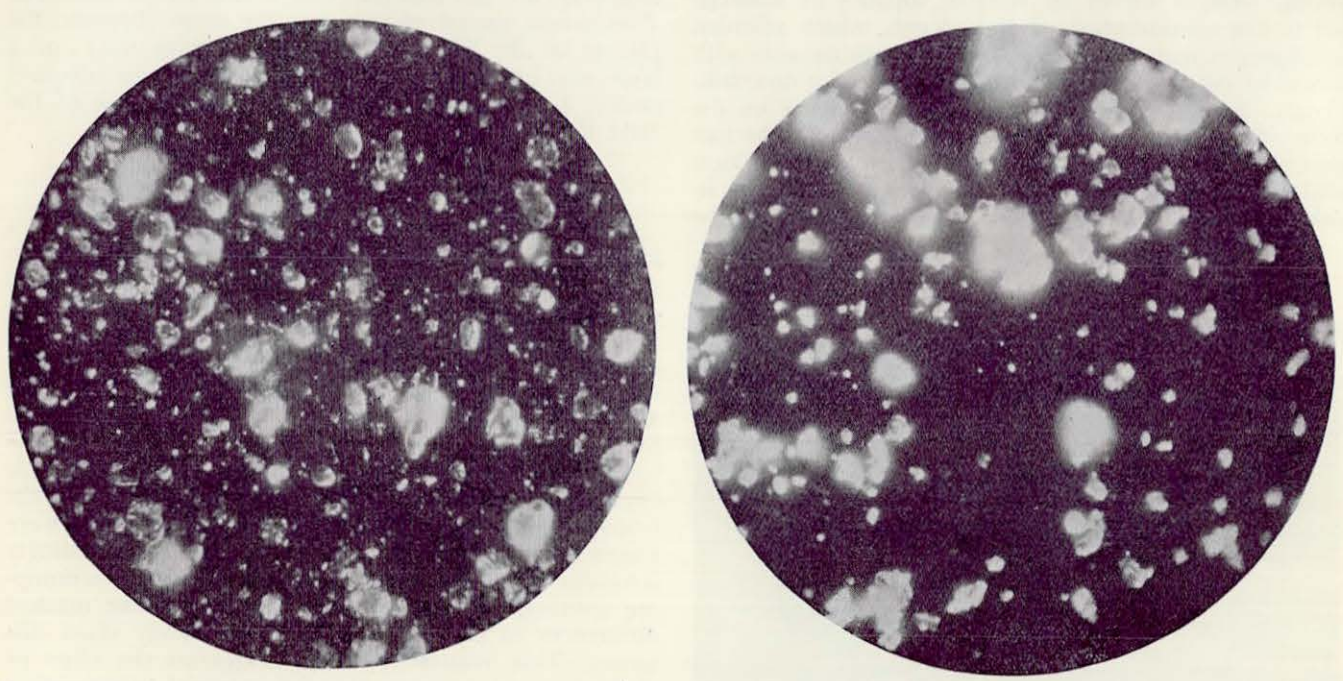
A study of this analysis led to the conclusion that there was no likelihood of any chemical change that would develop cementing qualities. The two minerals of primary importance, from the standpoint of the behavior of the material in the fill, are the kaolinite and the talc, the former because it comprises three fourths of the total, is light and soft and because it comprises the bulk of the fine material in the shale, and the latter because of its well-known qualities of slipperiness. Taken as a whole, 87 per cent of the minerals present may be characterized as soft and friable.

Observations based on experience with the shale in the fill and a careful study of its physical properties as a whole, also developed pertinent facts. Formed by slow geological processes and subjected to enormous pressures, it is found in a highly compacted condition, with only about six per cent of voids. The moisture content is estimated at 4.5 to 5 per cent, and it has a weight, undisturbed, of about 161 lb. per cu. ft. The dry weight is about 153 lb. and the absolute specific gravity is 2.61. It will absorb an additional 24 per cent of water, with an attending swell of 32 per cent in volume and a resulting weight per cubic foot of 130 lb. A volumetric increase in excess of the actual volume of water taken up is explained by the colloidal action of the fine particles, and is more properly described as "slaking." The fact that the individual fragments could increase in size, and, at the same time, the volume of the whole fill diminish, shows that the initial voids practically disappeared through the jetting process that was adopted, as explained later.

Observations of the shale as it was dumped into the fill developed the usual phenomonon of the larger masses rolling to the bottom of the slope, with the smaller pieces coming to rest at higher elevations. In addition, the flat pieces tended to take a position in the plane of the slope, thus producing natural cleavage planes which, as they became wet, produced highly slippery surfaces. There was, therefore, some tendency toward sliding, particularly where the toe of the slope was submerged in water and thus produced an initial slaking of the material at the bottom of the fill. This, however, was not a serious matter as the fill required for this project is of great width, and almost completely surrounded by old embankments—in other words, embankment slopes have been encountered in large part only as a temporary condition.

Behavior in the Fill

The real concern with respect to the shale related to its behavior in a vertical direction only. Experience showed also that swell due to voids between lumps as dumped into the bank amounted to about 35 per cent. Where



An Object Lesson in the Fineness of the Material in the Bald-Knob Shales. The Photomicrograph (513 Diameters) on the Left Shows Shale Particles, While the Corresponding View on the Right (Same Magnification) Shows Particles of Portland Cement

ground water is close to the original surface or where the area to be filled is submerged, the large masses in the lower portions of the fill tend to break up fairly early, but at other locations, consolidation of the fill can be effected only as moisture gets into the fill from the top or from rainfall on the dumping slopes during construction. This effect was delayed on account of light rainfall for two years of the construction period and because consolidation of the top of the fill from rainfall produces a blanket of virtually impervious material that keeps water from getting down into the fill. For this reason, the swelling effect of the slaking action of the shale is of minor importance in connection with the behavior of the fill—not enough water will ever get into the body of the fill to produce this result. It is of interest only in providing measures to prevent fouling of ballast. This has been avoided by the application of a sub-ballast of sand before applying the gravel ballast employed in the regular surfacing operations. The problem, therefore, resolved itself into one of getting enough water into the fill to produce solidification.

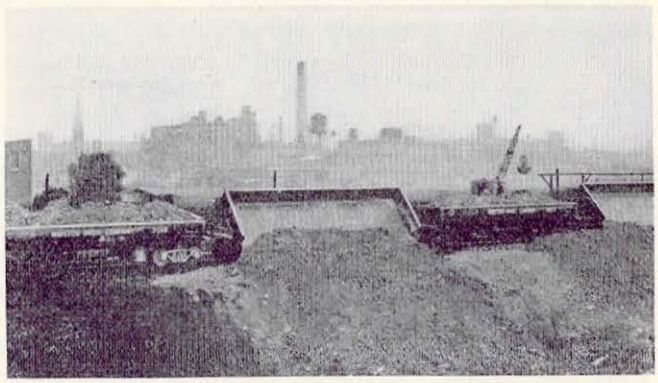
According to the plan evolved, this was done by jetting, water being introduced in an amount equal to 20 per cent of the volume of the fill. For convenience in doing this, the area to be treated was divided into units 12.5 ft. square, and a map was prepared showing the depth of fill in each square, so that with a known discharge of the jet pipe it was possible to express the amount of water to be applied in terms of the length of time that the jet was introduced in the center of each square. With the jet, pipe lines and pumping equipment used, this was ½ min. for each foot of fill. This is an average figure that was necessarily subject to some variation, because the discharge from the jets was, of course, affected by the loss of head on the pipe line and this in turn necessarily varied with the distance from the pump to the point of discharge in different parts of the filled area. To meet this situation the jetting time was adjusted by checking up on the rate of discharge as indicated on the water meter at the take off from the city water main. It should be noted that it was of great importance to use enough water, and just as important not to use too much. When the 20 per cent is increased to 30 per cent the material changes from a plastic solid to a viscous liquid. If it reached this state, it would probably never go back to a really solid condition, but remain a permanent mud. Inasmuch as the holes were spaced fairly close together, it was not especially important to get the exact amount of water into any particular hole, for, with the large expanse of fill, it could be counted on to average up. It was, however, very important to get the right total amount of water into each group of, say 40 or 50 holes.

How the Jetting Was Done

The jet used was a 10 ft. length of 2-in pipe with a 90-deg. bend at its upper end where it is threaded to permit it to be attached to the coupling of a standard 2½ in. fire hose by means of a reducing bushing. Water was supplied from city mains through a line of 5-in. and 3-in. wrought pipe laid on the surface from a two-stage Cressfield centrifugal pump, with 5-in. suction and discharge, that was operated by a 40-hp. General Electric induction motor. The maximum length of the pipe line, from the pump to the most remote part of the fill that was jetted, was about one mile.

The crew necessary to operate a jet consists of three or sometimes four men, as this number was necessary to handle the hose and jet pipe while the pipe was being supported in a vertical position ready to start the operation. All the area on which the jetting was done had been filled for a year or more, so that it was possible to handle the jetting as one independent job, unobstructed by filling operations. Part of the Bald Knob fill was under relocated railroad tracks already in service, so that is was not possible to jet all the fill that would have benefited by this treatment. The pay quantity actually jetted was about 1,200,000 cu. yd.; or, measured in embankment, about 1,600,000 cu. yd.

Check levels were taken at intervals for the purpose of determining the effect of the jetting and it was found that while most of the settlement took place in three or four hours, there was a well defined but rapidly diminishing settlement for a period of two to three weeks following the application of the water, after which almost no measurable change in the elevation of the surface was observed. In general, the solidification realized in this period of time amounted to from 8 to 10 per cent, depending upon what settlement had occurred in the fill before the jetting was done. In other words, the total settlement realized was from 10 to 12 per cent, and as this was substantially equivalent to the settlement obtained under natural conditions and heavy traffic in the older fills in a period of two or more years, it is evident that the acceleration process was thoroughly effective. Where trenches have been dug in the jetted material, it has proved to be evenly moist, and to be, so far as one can judge, practically without voids.



Progress in the Construction of the Fill was Rapid

The total cost of the jetting was about $28,000, or, about 2.3 cents per cu. yd., based on pay (excavation) quantities. The work was done by the C. G. Kershaw Contracting Co., as subcontractors for the Winston Brothers Company, general contractors for the grading, working under the direction of George P. Stowitts, engineer of construction, and of Col. H. M. Waite, chief engineer. The method used was worked out by Mr. Stowitts in conjunction with J. R. Colly, of the Kershaw Company and J. C. Agnew of the Winston Company. It had as a background the report on Bald Knob shales prepared by E. W. Reely of the terminal organization.

MOTOR TRAFFIC COMPETITION is being met by Italian state railways through speeding up some of their services, Commerce Department advices indicate. On October 28, a new twice-daily passenger service was instituted on a non-stop schedule of 103 minutes between Milan and Turin, a distance of 149 kilometers (93 miles). It is hoped to further reduce this time to 90 minutes. In order to make the line safe for speeds of 110 kilometers per hour reached on open stretches, the entire track was relaid with 100 pounds per meter rails, curves were reduced and all bridges strengthened, at a total cost of 70,000,000 lire (approximately $3,600,000).

Freight Car Loading 28,194,828 Cars for 1932

WASHINGTON, D. C.

COMPLETE reports for the year show that freight loading for 1932 amounted to 28,194,828 cars, the lowest figure for any year since the compilation of these statistics was begun. This was a reduction of 8,956,421 cars, or 24.1 per cent as compared with the total for 1931 and a reduction of 17,522,251 cars, or 38.3 per cent, under the total for 1930. As compared with 1926 or 1929 it was a decrease of 47 per cent. The comparison by commodities follows:

	1932	1931	Per Cent Decrease
Grain and Grain Products	1,653,076	2,024,394	18.3
Live Stock	949,091	1,162,060	18.3
Coal	5,339,303	6,493,200	17.8
Coke	223,772	324,743	31.1
Forest Products	899,542	1,471,398	38.9
Ore	210,759	874,673	75.9
Merchandise, L. C. L. Freight	9,079,066	10,948,873	17.1
Miscellaneous	9,840,219	13,851,908	29.0
TOTAL	28,194,828	37,151,249	24.1

For the week ended December 31 loading of revenue freight amounted to 406,779 cars, a decrease of 87,801 cars as compared with the preceding week, and the lowest figure ever recorded for a week. This included the Christmas holiday. As compared with the corresponding week of 1931 it was a decrease of 95,948 cars and as compared with 1930 it was a decrease of 208,081 cars. All districts reported reductions. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday, December 31, 1932

Districts	1932	1931	1930
Eastern	96,068	117,234	137,325
Allegheny	79,780	100,889	120,736
Pocahontas	29,645	29,659	39,250
Southern	60,033	75,709	97,379
Northwestern	44,198	53,132	68,630
Central Western	61,084	76,394	99,637
Southwestern	35,971	49,710	51,903
Total Western Districts	141,253	179,236	220,170
Total All Roads	406,779	502,727	614,860
Commodities			
Grain and Grain Products	22,029	23,960	32,693
Live Stock	13,350	18,301	20,986
Coal	99,847	106,429	143,485
Coke	4,319	5,939	8,448
Forest Products	9,449	13,721	23,977
Ore	1,455	2,289	4,889
Mdse. L. C. L.	127,271	149,502	168,209
Miscellaneous	129,059	182,686	212,173
December 31	406,779	502,727	614,860
December 24	494,580	440,899	536,292
December 17	516,796	581,170	713,865
December 10	521,216	613,621	744,353
December 3	547,461	636,366	787,072
Cumulative total, 52 weeks	28,194,828	37,151,249	45,717,079

The freight car surplus on December 14 was 648,982 cars, an increase of 27,351 compared with the number on November 30. The total included 364,809 box cars, 209,950 coal cars, 32,120 stock cars, and 13,661 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended December 31 amounted to 25,071 cars, as against 31,763 cars for the previous week and the index number declined from 55.08 to 54.68. Light loading of grain, coal and merchandise were the chief factors in this decline. The decrease in merchandise, however, was seasonal and the index number dropped only slightly.

For the year the total loadings amounted to 2,173,087 cars, which was a decrease from 1931 loadings of 401,924 cars, or 15.6 per cent, and a decrease of 41 per cent from the peak year, 1928. The heaviest decrease from the 1931 loadings was 27 per cent in miscellaneous freight. Merchandise decreased by 12 per cent, lumber by 38 per cent, and pulpwood by 41 per cent. Coke, with an increase of 326 cars, was the only commodity to show heavier loading than in 1931.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
December 31, 1932	25,071	14,271
December 24, 1932	31,763	17,339
December 17, 1932	36,494	17,697
December 26, 1931	30,950	18,041
Cumulative Totals for Canada:		
December 31, 1932	2,173,087	973,235
December 26, 1931	2,575,011	1,282,500
December 27, 1930	3,146,247	1,698,536

I. C. C. Cannot Order Line into New Territory

WASHINGTON, D. C.

CHARACTERIZING as "an attempted exercise of a power not conferred" the Interstate Commerce Commission's order requiring the Union Pacific system to build an 185-mile extension in Oregon, the Supreme Court of the United States, in a decision rendered on January 9, held that the power conferred upon the commission by the Transportation Act to require a railroad to "extend its line or lines" is confined to extensions within the undertaking of the carrier to serve, and cannot be extended to embrace the building of what is essentially a new line. The opinion, by Justice Roberts, was rendered on an appeal taken by the Interstate Commerce Commission and the state public utilities commissions of Oregon and Idaho from a decision of the district court for the district of Oregon which had issued an injunction against the commission's order. The United States had refused to join in the appeal. The commission's order, issued on a complaint filed by the Oregon commission, had directed the Union Pacific system, through the Oregon-Washington Railroad & Navigation Company, to extend its line now terminating near Burns, Ore., from Crane, Ore., across the central part of the state and the "High Desert" to a connection with the Southern Pacific near Crescent Lake.

If the power conferred in paragraph 21 of Section 1 of the act were as broad as contended by the commission, the court said, it could go as far as to compel a carrier having lines reaching Chicago and St. Louis, but none connecting those cities, to build a railroad between them, but it held that Congress had not intended to confer such a broad power. "We should expect," it said, "if Congress were intending to grant to the commission a new and drastic power to compel the investment of enormous sums for the development or service of a region which the carrier had never theretofore entered or intended to serve, the intention would be expressed in more than a clause in a sentence dealing with car service." It also indicated that if Congress had attempted to confer such broad power grave questions of its constitutionality would have arisen.

Justices Brandeis and Stone joined in a dissenting opinion by Justice Cardozo which took the position that the limits of the commission's duty are not appropriately defined "by dividing the field into extensions big and little, with a power of regulation excluded from the one section and admitted in the other," and that such orders

of the commission would be valid "if kept within the range of reason."

Prior to the adoption of the Transportation Act, Justice Roberts said, in a number of cases the high court had passed on and defined the authority of a state to require extensions of existing service and facilities, but where the state's mandate involved the rendition of a service beyond the agreement of the carrier, the order was annulled. Following are some extracts from the opinion:

The phrase "and to extend its line or lines" is part of a single sentence committing to the commission the power to require carriers to provide safe and adequate facilities for car service as defined in the act. The reasonable conclusion is therefore, that the extensions mentioned have to do with car service, and are not intended to create a wholly independent subject of jurisdiction. In the proviso the furnishing of facilities and extension of lines are blended as belonging in a single class. We should expect, if Congress were intending to grant to the commission a new and drastic power to compel the investment of enormous sums for the development or service of a region which the carrier had never theretofore entered or intended to serve, the intention would be expressed in more than a clause in a sentence dealing with car service.

Moreover, if the purpose were that claimed by the commission support should be found in legislative history. But none has been called to our attention. In the report to Congress for 1919 the commission reiterated an outline of the policies previously suggested for legislative action in view of the approaching termination of federal control. No intimation is given that carriers should be required to build into territory they had not undertaken to serve. The scope of the recommendation was not enlarged in the testimony before the committee of the Senate having the Transportation Act in charge.

That paragraph 21 refers to the service the carrier has bound itself to render is further emphasized by the omission to make the future public convenience a factor to be considered. A presently existing public need is expressly stated as prerequisite to the compulsory extension of a line. On the other hand, paragraph 18, which covers voluntary construction, conditions approval on present or future convenience or necessity. Congress therefore drew a distinction between what might be permitted and what compelled. These differences in the two sections were disregarded by the commission, and are overlooked by the appellants.

The cases above cited, dealing with the powers of state authorities in the matter of extensions of lines and service, furnish a background which must have been in the minds of both of the commission and of the Congress at the time of the passage of the Transportation Act. Those decisions show that due process is denied by requiring service which goes beyond the undertaking of the carrier. Orders for extensions of line were sustained whenever reasonably required in the interest of car service and for interchange of traffic. No extension ordered for the service of new territory had been approved.

Wherever the state attempted to enforce a regulation or demand extension of facilities outside the company's undertaking to serve the public, the power was negatived for the very reason that the attempted exercise called on the railroad company for something beyond its agreement.

The Act, reasonably construed, distinguishes between three sorts of facilities—new lines, or extensions, voluntarily undertaken (section 18); compulsory extensions within the area which the carrier has bound itself to serve (section 21); and spur, industrial, team, switching or side tracks located wholly within one state, which are left within state control (section 22). The second class is distinct from the others and embraces, as the decisions show, a substantial field. But this field is not, as the commission holds, coterminous with that created by paragraph 18. If it were, power would exist to compel a carrier having lines reaching Chicago and St. Louis, but none connecting those cities, to build a railroad between them. Though in truth a new line, the appellants would call this an extension of the existing lines. If the grant of authority is broad enough to support the order in the present case it would also justify such a hypothetical requirement as we have supposed. We cannot so read the statute, but think the power granted by paragraph 21 is confined to extensions within the undertaking of the carrier to serve, and cannot be extended to embrace the building of what is essentially a new line to reach new territory.

There is another consideration which supports the construction adopted. Our duty is to construe the statute, if fairly possible, so as to avoid not only the conclusion that it is unconstitutional, but also grave doubts upon that score.

The views advanced by the appellants, to say the least, raise serious questions in this respect. The railroads, though dedicated to a public use, remain the private property of their owners, and their assets may not be taken without just compensation.

The Transportation Act has not abolished this proprietorship. State courts have uniformly held that to require extension of existing lines beyond the scope of the carrier's commitment to the public service is a taking of property in violation of the Federal Constitution.

The decisions of this court will be searched in vain for the announcement of any principle of constitutional interpretation which would support the order of the commission. Those decisions are far from sustaining the validity of an order which seeks to require the investment of millions of dollars in a new venture in undeveloped areas. Such a compulsion imposes upon the carriers and its property "burdens that are not incident to its engagement." The construction we adopt makes it unnecessary to pass upon the grave questions of constitutional validity raised by appellant's argument.

It is urged that as the order involved trackage amounting to only 1.2 per cent of that now maintained by the Union Pacific System, the requirement may properly be considered an extension rather than a new line, though a different view might prevail if the Oregon-Washington alone be considered. But whether the order be treated as a command to the Oregon-Washington Company as a separate corporate entity, or as an injunction to the Union Pacific System, it is an attempted exertion of a power not conferred. Assuming, without deciding, that the commission was entitled to treat the Oregon-Washington company as an instrument of the Union Pacific System, and the required extension, therefore, as one adding only a small percentage to the present mileage of the system, still the purpose is to compel a new investment for the development of a new area at the request and in the interest of the state of Oregon, whose desire is that its natural resources shall be exploited.

Finally it is claimed that however narrowly the power to compel extensions be construed, the order was justified by the facts developed before the commission. They are said to disclose an undertaking by the Oregon-Washington Company to serve the region in question. Much is made of the circumstance that when the complaint was filed the company had a charter under which it was authorized to build a line on the location of that which the order describes. The possession of the franchise is said to give rise to an implied agreement to serve the district. The company's having in contemplation the building of the road would in this view render the commission's action unassailable. But authority to build the line, if the company were so minded, involved no commitment to construct it.

Though by appropriate legislation the state might forfeit the charter for non-user, the continued existence of the franchise imposed no obligation to exercise the charter powers. The Oregon-Washington Company chose not to serve the territory which the cross-state line would reach; has not desired and does not now desire to enter upon the project. Whether the railroad held itself out to serve the region in question must be decided in the light of all the facts. The record demonstrates that the territory to be traversed was one the company had neither actually nor impliedly agreed to serve with transportation facilities.

The decree is affirmed.

* * *

Installing Underground Parkway Cables for High and Low Voltage Signal and Communication Circuits in Connection with the Electrification of the Reading's Chestnut Hill Branch—This Branch Runs Through a Residential District and the Right-of-Way Is Restricted, Making it Difficult to Maintain a Pole Line After Electrification—The Use of Parkway Cables Makes it Unnecessary to Install Underground Ducts

Railway Employees Ask Retirement Insurance

WASHINGTON, D. C.

HEARINGS were begun before a sub-committee of the Senate committee on interstate commerce on January 11 on the rival bills to provide for the establishment of a uniform retirement insurance-pension system for railway employees, to be administered by a government board, which have been introduced by Senator Wagner, of New York, S. 3892, and by Senator Hatfield, of West Virginia, S. 4646. The Wagner bill represents the plan endorsed by the Railway Labor Executives' Association as the result of several years of study, while the Hatfield bill is advocated by the Railway Employees' Pension Association, whose members have been bombarding members of Congress with postal cards urging its passage. A similar bill was introduced in the House by Representative Keller, of Illinois, who also sat with the Senate sub-committee, while the counterpart of the Wagner bill was introduced in the House by Representative Crosser, of Ohio. The House committee on interstate and foreign commerce has decided not to consider the bills at this session.

Mr. Richberg's Testimony

The opening testimony was given by Donald R. Richberg, counsel for the Railway Labor Executives' Association, who explained the Wagner bill and pointed out some of the marked differences between it and the Hatfield bill. It was arranged that proponents of the two bills should be heard first, after which testimony will be given on behalf of a committee representing the railways. The Senate sub-committee includes Senators Wagner, Glenn, Hatfield, Hastings, and Wheeler. At the outset Senator Wheeler referred to the differences of opinion among railway employees as to the two bills, saying that an "overwhelming majority of the rank and file" in his state and probably in the Northwest generally preferred the Hatfield bill. Mr. Richberg said that "certain active groups" among the rank and file have been supporting it but that that means that many of them do not understand the provisions of the two bills. The plan of the Wagner bill has been unanimously approved by the executives of all the organizations, he said, and back of that there has been in many cases convention action in approval of retirement insurance. Senator Hatfield then remarked that he had introduced his bill at the solicitation of the "rank and file" in West Virginia and that he had an open mind on the subject. Senator Wagner also announced that he had an open mind and was not committed to the details of any plan. Mr. Richberg's explanatory statement follows in part:

This bill does not seek to impose any novel obligation or unprecedented burden on the railroads. According to railroad officials pensions are now being paid by railroads which employ about 95 per cent of the total railroad employees. The principle that aged rail workers should be retired on part pay is thus generally accepted.

There are two major faults in the present system of voluntary pensions. First—Every railroad has its own pension plan with great differences in provisions for retirement and the amount of pensions paid. This inequality of burden and benefit is unfair to both the railroads and their employees. Second—Since all pensions are voluntary gifts, the employee has no security, no enforceable right; and the railroad has no legal obligation. Therefore in hard times pensions will be reduced (as at present); and when financial difficulties embarrass a railroad pensions which are the anticipated rewards of lifelong labor may never be paid.

Senator Wagner's bill seeks to establish a uniform system affecting alike all railroads (engaged in interstate commerce) and their employees, providing primarily retirement insurance. That is, railroads and their employees make equal contributions to a retirement insurance fund out of which annuities are paid to employees when they are retired from service between the ages of 65 and 70 years. This annuity is 2 per cent of an employee's average annual compensation multiplied by the number of his years of service.

In addition to this retirement insurance, the bill also provides what are really *pensions* for employees now old in the service who would not be able to build up an adequate retirement annuity by contributions in their remaining years of service. To protect these veterans the bill provides for a "prior service pension fund," created also by equal contributions from employer and employees. Thereby men now old in the service will receive not only the retirement insurance they help to buy but also an additional pension which their fellow employees help to provide for them, so that they may live decently in old age.

Before explaining the details of this system let me emphasize the candor and actuarial soundness of Senator Wagner's bill. It would be very easy to draw a simple bill providing attractive pensions for railway employees, to evade stating the cost, and to avoid a great many problems that must be solved by leaving them to be solved by a board of administration. Such a bill could be proposed to the employees and gain wide support—so long as the employees were kept in ignorance of how much it would cost them. Such a bill might obtain support from members of Congress until they investigated how much it would cost and how it would work.

But eventually members of Congress and railroad employees must face these decisive questions: How much will this cost? Who will pay the bill? These questions cannot be answered by giving a pension board a blank check, signed by the railroads and their employees and by authorizing the board to pay whatever cost is necessary out of the earnings of the railroads and the wages of the employees. No such unlimited grant of authority will ever be approved by Congress, or the railroads or the great body of railroad employees.

Therefore Senator Wagner's bill provides carefully and expressly a comprehensive and a sound system of retirement insurance and pensions. Probably all of its provisions can be improved in the light of further study and information. If the money can be found to pay the cost its benefits may be increased. If its burdens upon railroads or their employees are too heavy they can be reduced. Whatever may be necessary for a sound, workable system can be provided by revisions. But questions are not answered by ignoring them.

There is no alternative to meeting the questions raised by this bill. They must be answered in any bill worthy of consideration. If payments are promised their amount must be calculated and provision made to collect the money to meet them. The railroad managements may speak for themselves, but, speaking for the overwhelming majority of the employees, represented only by their long established, responsible organizations, I would make it clear that they are not being stampeded by glittering promises of pensions that someone else is supposed to pay. They know that the major cost of retirement insurance and pensions will come out of their pockets. They want to see written in any legislation not only promises of how much money they are going to receive, but, even more important, they want to know how much money they are going to be compelled to pay.

If any think that the benefits provided for in the bill are not enough they could write in larger percentages, he said, but they should understand that they would have to be met by larger contributions. In pointing out the principal differences between the two bills he said the Wagner bill is based on "fifty-fifty" contributions by the companies and the employees, while the contributions are described in a very vague and uncertain manner in the other bill because they are based on a uniform percentage, to be determined by the board, but the percentage to be contributed by the railways is a percentage of the gross earnings while that of the employees is a percentage of their compensation. "Why not be straightforward and say that this means a two-thirds contribution by the companies and a one-third contribution by the employees?" he asked, adding that if a man prefers one bill over the other after understanding them it simply means that he wants more. He also pointed out that the Hatfield bill provides for percentages to be determined by the board to represent as nearly as may be what is found necessary to meet the payments and said that if this means no reserve funds it is a "hand-to-mouth proposition that railway employees knowing the situation could not possibly support because it would eventually break down." Such a plan, he said,

means levying on the men today without building up a fund for the future, the cause of the break-down of many such plans in the past. He said the organizations had had a great deal of experience with such plans and the conductors have given up theirs while that of the engineers is on the verge of dissolution, and the railway witnesses would show the effects of their present hand-to-mouth system under which no reserves are built up. The railways, he added, are not obligated, because the present system represents a bounty, but it is the desire to build up a sound system that can be depended upon.

The contributions to the prior service pension fund, Mr. Richberg explained, would be 1½ per cent paid annually by each side, and because it is realized that the demand on that fund would be very heavy at first while the demand on the retirement fund would be light it is proposed to provide for a temporary transfer of funds. Later the pension fund would cease to exist and the funds would be transferred back. In working out the plan, he said, a difficulty was faced in the lack of comprehensive statistics, but several meetings have been held between committees representing the organizations and the railways to see if they could help each other. The railways have better statistics, he said, and are vitally interested in the subject because the pension problem is a big one for the railroads today. Taking up the provisions of the bill in detail he explained that the contributions would be paid into the Treasury of the United States and be invested in obligations of the United States. He pointed out that the provision for retirement after 30 years of contributory service applies only after the passage of the act and said that there may be a question as to whether men should be retired after a certain length of service if they have not reached retirement age. He also explained the provisions for disability payments, which he said should not be duplicated if taken care of under another plan, and for the payment of a surrender value in case of death or termination of service. In case of furloughs or termination of service provision is made by which an employee may continue retirement insurance based on his own payments.

The percentages of contributions are set forth in the bill in a "schedule of standards" and are subject to revision by the board from time to time for the purpose of making minor corrections, but Mr. Richberg said that the board was not intended to have any large discretion in the matter. Briefly, the bill provides for step-rate contributions, beginning with 2 per cent for employees of ages 21 to 34 and increasing gradually to 5 per cent for employees of 50 years and over. This casts a heavy burden on the younger men, Mr. Richberg said, and may explain why Senators are receiving cards from older men who expect to receive immediate pensions without having contributed. The younger men not only pay the higher percentages but also pay 1½ per cent for the benefit of the men of prior service for which they get nothing themselves. However, he said, the cost of the other plan would be much greater and one of the objections being made is that the Wagner bill plan is not more liberal. Advocates of the Hatfield bill have said that under it 112,000 men would be retired the first year and would receive payments amounting to $135,000,000. Mr. Richberg continued, but he said that no opportunity would have been afforded to accumulate such a fund and that if that amount was anywhere available to pay pensions it would be equally available to pay the men who are working and therefore could be raised only at their expense in the long run. He said he could hardly express his opinion of such a plan in measured words and that it would not be tolerated if understood.

An explanation of the Hatfield bill was begun by H. L. Ekern, representing the Railway Employees' Pension Association, which he said was organized nearly four years ago and has a nation-wide membership of all classes of employees. He said he did not agree with some of Mr. Richberg's statements but he seemed more interested in pointing out the similarities in the two bills than their differences, mentioning 15 points on which he said they are in agreement and expressing a willingness to adopt some of the ideas of the later bill. He readily admitted that the Hatfield bill plan does not provide for a reserve fund, saying that it would require a very large fund to start out with a reserve, and that he had condemned as severely as anyone any plan that attempts to pay current payments out of current income under the ordinary condition by which the membership is optional. However, he said that in this instance it would be compulsory on all employees. The Hatfield bill provides for payments equal to 2½ per cent for each year of service, the percentage of contribution by companies and employees to be determined by a pension board from time to time, but he said this would be determined mathematically and not by the discretion of the board, by adding the gross earnings and the employees' compensation and taking such percentage as might be necessary. He said it had been estimated that the percentage for the first year would be 2.56 per cent and would amount to about $200,000,000, of which the railways would pay $134,000,000. This is about four times as much as they now pay in pensions because it covers more men and more than doubles the usual payment for each year of service. When S. T. Bledsoe, general counsel of the Atchison, Topeka & Santa Fe, asked what percentage this would be of the railways' net, the witness did not have the figures. He estimated that after passage of this bill some 60,000 employees could retire because they had reached the age of 65 and about as many more who have had 30 years of service, thus making places for that many younger men. He estimated that after ten years the percentage of contribution would reach 4¼ per cent and that after 20 years it would be about 6 per cent.

* * *

Courtesy Chicago Tribune.

The Old Man of the "I. C. C."

NEWS

Basic Maladjustments Delay Business Revival

Corrections must come before lost rail traffic returns, says Samuel O. Dunn

To create more traffic we must revive business by correcting the maladjustments in production and distribution that have caused and prolonged the depression, according to Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Company, and editor of the *Railway Age*, in an address before the Cincinnati Chamber of Commerce Forum on January 10. "Existing maladjustments are partly due to the fact that present costs of railway transportation are too high in proportion to prevailing prices and incomes in other fields. The cost of railway transportation must be reduced by readjustments of wages and by other measures. There is need for readjustments in the relations between farmers and other producers of raw materials, on the one hand, and the industries from which they must buy, on the other hand, that will help to increase the power of farmers and other producers of raw materials to buy transportation and manufactured products. We cannot revive general business on a large scale without so readjusting the purchasing power of the various classes of the people as to enable every large class to buy the products of other large classes.

"Within the transportation industry there exists a serious maladjustment, because the railroads are so regulated without being subsidized, and all their competitors are subsidized without being regulated, that the railways are being seriously handicapped by unfair competition in recovering their earning, employing and purchasing power. An additional serious maladjustment in transportation is the wide disparity between the working conditions and wages of railway employees, on the one hand, and of employees of carriers by water and highway, on the other hand.

"One of the most important maladjustments which must be corrected is that due to the fact that costs of government and general taxation have become extremely excessive in proportion to the reduced incomes of those who must pay taxes; and one way in which the burden of general taxation should be reduced is by requiring those who use waterways and highways built and maintained at public expense to pay adequate tolls and rentals for their use of this public property.

"While we are talking about increasing government expenditures upon public works to increase employment, we might much better be considering the correction of such maladjustments as those which have caused the unemployment of 2,000,000 men on the railroads and in industries dependent upon them for a market, and of probably at least another million men who are out of work because of the decline in the construction and improvement of the people's homes. We can restore prosperity only by reviving private business in all lines; and the sooner we make the readjustments required to re-establish parity between the purchasing powers of different classes, and to give the people opportunity to spend more of their incomes in their own ways, instead of having so much of them taken in taxes and spent by our governments, the sooner we shall have the revival of general business essential to general prosperity."

Federal Ownership, Private Operation

Banker urges plan, saying private capital cannot compete with subsidized motors

Asserting a belief that "the long-continued extent of this panic is due more largely to the tragic absence of a market for railroad securities than to any other single feature," George Foster Peabody, the veteran banker and railroad financier, in a lengthy letter to the New York Times has proposed a plan for dealing with the railroads which would amount, virtually, to government ownership with provision for private operation by a number of competing companies.

"I suggest," the proposal reads in part, "the creation of a Federal Railroad Authority with full power to issue serial bonds, in such amounts as may be found necessary to acquire all railroad property in the United States—this Authority to have complete power to negotiate for the exchange of securities with present railroad corporations or committees representing said securities; the Authority to be given complete powers of eminent domain respecting all interstate railroad properties and traffic; to have full power to reorganize under operating divisions all of the varied properties to be acquired; to have power to make operating leases for limited periods of such portions of the properties acquired as may, after a period of one year, seem to the Authority suitable to develop the greatest efficiency, through a possible measure of competitive

(*Continued on page 52*)

Transport Legislation Sidetracked in Congress

Attitude of House committee precludes action on pending bills at this session

Railroad and other transportation legislation was added to the long list of controversial problems which the Congressional leaders are saving up for possible consideration after March 4 when the House committee on interstate and foreign commerce on January 5 decided upon a program of comparative inactivity for the remainder of this session of Congress unless the Senate committee shows some interest in the subject. This means that most of the proposals that have been made for a revision of the transportation act of 1920 and for regulation of highway transportation will probably be again postponed, although some efforts are being made to impress upon members of both committees the vital need for their attention to the problem, particularly since it is the announced desire of the new administration to avoid an extra session after March 4.

The House committee decided to hold hearings on the bill introduced at the last session by Chairman Rayburn to authorize the Interstate Commerce Commission to delegate to individual commissioners or employees the power to perform certain specified duties and to consider and determine certain specified matters which now require the attention of the commission or a division thereof; but it planned no action on other transportation bills or proposals. It was decided that it would be impossible to pass through both the House and the Senate at the short session the bill to amend the rate-making and recapture provisions of Section 15a or the holding company bill, both of which were reported by the committee at the last session, and that the bill for the regulation of bus transportation would not be taken up unless the Senate committee on interstate commerce acts on a similar bill now pending before it. A bus bill was once reported by the committee and passed through the House but in the Senate after some debate it was re-committed and protracted hearings were held on such a bill at the last session. If someone should succeed in prodding the Senate committee into action the House committee would be glad to press either of these bills.

The House committee also decided to close on January 6 the hearings on the full-crew bill which were begun on January 3, without hearing from the railroads in re-

(*Continued on page 52*)

Protest Bridge Changes Along Waterway Project

Railways object to costly relocations proposed in connection with Calumet improvements

E. C. Craig, general solicitor of the Illinois Central, and a committee of railroad counsel appeared at a hearing before the House committee on rivers and harbors at Washington on January 5 to protest against the adoption of part of the project for the improvement of Calumet river and harbor, south of Chicago, which would require the relocation and reconstruction of existing railroad bridges and other facilities at a cost of about $6,000,000. The Congressional committee had tentatively approved a project recommended by the Chief of Engineers for the improvement of the harbor and the widening and deepening of the river at a total estimated cost of $4,540,000. The part of the project to which the railroads objected includes the widening and straightening of the upper part of the river where it is crossed by a highway bridge and three railroad bridges owned by the Calumet Western, the Chicago & Western Indiana, and the New York, Chicago & St. Louis. It would require land for the bridge approaches and would also require the elevation of the tracks of the Kensington & Eastern at an estimated cost of $706,000. A written protest was filed by the roads. Mr. Craig in his oral statement pointed out that the only present purpose of the improvement in the upper part of the river is to enable lake vessels to use a turning basin located above the bridges and afford them a slightly more convenient method of operation, and that this expenditure, whether made by the government or by the railroads, is not justified under present conditions.

Before the railroad testimony, Brig. Gen. George B. Pillsbury, assistant Chief of Engineers, told the committee that the question whether the railroads would have to reconstruct the bridges would be determined by the Secretary of War, independently of the adoption of the river improvement project, following a hearing to be held at Chicago on February 21 on a request filed by the Lake Carriers' Association for an order requiring their removal as an unreasonable obstruction to navigation. He said this question would be decided on the basis of existing conditions and that he was unable to see that the question of the eventual straightening of the channel had anything to do with it since part of the project, including the upper turning basin which the vessels wish to reach, has already been completed. Mr. Craig said, however, that if the committee does not approve of that part of the project the railroads would have no difficulty at the Chicago hearing in proving that the relocation of the bridges is not justified. But if the project in its present form should be adopted the bridge changes would necessarily be included.

According to the railroad protest the district engineer in his report on the project had taken into consideration future barge traffic on the Calumet river to be expected upon the completion of a deep waterway to the sea by the St. Lawrence or some other route and upon the completion of a proposed connection with the Illinois waterway; but that all this is still purely speculative. It is proposed that the government spend less than $400,000 on this part of the river but the railroads would have to spend 15 times as much. "Why should any part of the work be done at this time when the people are so oppressed with taxes?" it said, adding that "the expense incident to the changes in the bridges is as much a part of the waterway costs as are the expenditures to be made by the government and it should be considered and classed as such."

Signal Section Meeting May 9

The annual convention of the Signal Section of the American Railway Association will be held at the Hotel Roosevelt, New York, on May 9 and 10.

Refuses to Re-Open Moffat Bond Case

The Colorado Supreme Court on January 7 refused to re-open the case of the excess bonds issued to build the Moffat tunnel, when counsel for bondholders petitioned for a re-opening. On December 19, the court held, by a vote of 4 to 3, that the excess bonds were valid, stating that this was the finding of the United States court which previously ruled on the case.

Pick-Up and Delivery Service on Great Northern

Pick-up and delivery service by motor truck for l. c. l. freight moving between Seattle, Wash., and Tacoma, and between Seattle and 12 towns in the Wenatchee and Okanogan valleys, is now being offered to shippers by the Great Northern. The new service went into effect on January 1, and is designed to meet the competition of companies operating motor trucks.

Hampton Roads Coal Rate Suspended

On protest of the railroads serving the ports at Hampton Roads, and others interested in tidewater transshipment coal rates, the Interstate Commerce Commission on January 9, suspended from January 10 until August 10, the operation of tariff schedules filed by the Interstate Railroad proposing to reduce the rate on bituminous coal from $2.72 to $2.62 per ton from mines on its line to Lambert Point, Va., for transshipment by vessel to points beyond the Virginia capes. According to the protests, this reduction was published by independent action of the Interstate after the executives of almost all eastern lines participating in the transportation had disapproved the proposal.

Net for Eleven Months a 1.2 Per Cent Return

Figure of $301,156,515 compares with $510,327,096, the 2.03 per cent return of 1931

Class I railroads for the first eleven months of 1932 had a net railway operating income of $301,156,515, which was at the annual rate of return of 1.20 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first eleven months of 1931 their net railway operating income was $510,327,096, or 2.03 per cent.

Operating revenues for the eleven months totaled $2,915,866,458, compared with $3,947,775,573 for the same period in 1931, or a decrease of 26.1 per cent. Operating expenses amounted to $2,241,180,585, compared with $3,024,088,636, or a decrease of 25.9 per cent.

In the eleven months they paid $263,834,357 in taxes compared with $291,737,061 for the same period in 1931 or a decrease of 9.6 per cent. For November alone, the tax bill amounted to $19,693,931, a decrease of $126,453. Sixty-one of these roads failed to earn expenses and taxes in the first eleven months of 1932, of which 18 were in the Eastern district, 16 in the Southern and 27 in the Western.

For November the record shows net railway operating income of $34,179,119, which, for that month, was at the rate of 1.55 per cent. In November, 1931, the net was $36,787,707 or 1.67 per cent. Operating revenues for November amounted to $253,574,864 compared with $305,373,862 in November, 1931, a decrease of 17 per cent; operating expenses were $189,667,306, a decrease of 20.5 per cent.

In the Eastern district the record for eleven months shows a net of $200,072,559, or at the rate of 1.72 per cent. For the same period in 1931 the net was $263,889,187 or 2.28 per cent. Operating revenues in the Eastern district for eleven months totaled $1,489,186,686, a decrease of 24.6 per cent below 1931, while operating expenses totaled $1,104,000,026, a decrease of 27 per cent. The Eastern district record for November shows a net of $20,265,254, compared with $17,510,473 in November, 1931.

For the Southern district for eleven months the record shows a net of $20,403,274, or at the rate of 0.67 per cent. For the same period in 1931, the net amounted to $40,978,878, or at the rate of 1.34 per cent. Operating revenues in the Southern district for the eleven months amounted to $348,233,864, a decrease of 27.6 per cent, while operating expenses totaled $289,669,532, a decrease of 26.8 per cent. The

CLASS I RAILROADS—UNITED STATES

	1932	1931	Per Cent Decline
Month of November			
Total operating revenues	$253,574,864	$305,373,862	17.0
Total operating expenses	189,667,306	238,497,164	20.5
Taxes	19,693,931	19,820,384	0.6
Net railway operating income	34,179,119	36,787,707	7.1
Operating ratio—per cent	74.80	78.10	...
Rate of return on property investment	1.55%	1.67%	...
Eleven months ended November 30			
Total operating revenues	$2,915,866,458	$3,947,775,573	26.1
Total operating expenses	2,241,180,585	3,024,088,636	25.9
Taxes	263,834,357	290,737,061	9.6
Net railway operating income	301,156,515	510,327,096	41.0
Operating ratio—per cent	76.86	76.60	...
Rate of return on property investment	1.20%	2.03%	...

Southern district record of net for November was $3,258,769, compared with $3,306,765 in November, 1931.

The record of the Western district for eleven months shows a net of $80,680,682, or at the rate of 0.77 per cent. For the same eleven months in 1931 the net was $205,459,031, or at the rate of 1.95 per cent; operating revenues for eleven months amounted to $1,078,445,908, a decrease of 27.7 per cent, while operating expenses totaled $847,511,027, a decrease of 24 per cent. For November, the net in the Western district was $10,655,096; for November, 1931, it was $15,970,469.

Frisco Abandons St. Louis Suburban Service

The St. Louis-San Francisco, following permission from the Missouri Public Service Commission, has abandoned all suburban train service between St. Louis and Valley Park in St. Louis county, seven trains being discontinued on December 31. For the year ended December 3, 1932, the Frisco experienced a deficit of $37,360 on its suburban passenger service to and from St. Louis.

Wage Statistics for October

The compensation paid to railway employees for the month of October was $125,471,344, an increase of over $6,000,000 as compared with that for September, according to the monthly compilation of railway wage statistics issued by the Interstate Commerce Commission. The number of employees as of the middle of October was 1,033,225, an increase of 22,785 over the number in September but a decrease of 192,174 as compared with the number in October, 1931.

Club Meetings

The Western Railway Club will hold its next regular meeting on Monday evening, January 16, at the Hotel Sherman, Chicago. Thomas R. Cook, manager of inspection and field service, Baldwin Locomotive Works, Philadelphia, will present the subject "The Relation of Locomotive Operation to Railroad Net Operating Income."

The Eastern Car Foremen's Association will hold its next meeting at 29 West Thirty-ninth street, New York City, on Friday evening, January 27. L. J. McAuliffe, assistant chief clerk, Central of New Jersey, will present a paper on the Interchange Rules.

Chicago Association Favors Continuation of Higher Rates

The Chicago Association of Commerce has adopted a resolution supporting the carriers' petition now before the Interstate Commerce Commission, asking for the continuation of the rate schedules originally authorized in the 15 per cent case, but limiting the period of extension from March 31, when the present rate increase expires automatically, to October 31. In supporting the temporary extension, the association contends that the increases are necessary to insure the preservation of adequate transportation, pointing to the continued decline of railroad traffic and revenues during the past year, and maintaining that railroad transportation is now in an even more precarious condition than when the rates were originally authorized. In its resolution, the association also deplores the failure of the railroads to adjust wages, the largest item in their operating expenses, in harmony with the reduced cost of living, as have other branches of industry.

Accounting for Rebuilt Cars

Division 4 of the Interstate Commerce Commission has issued an order in connection with the Chesapeake & Ohio's accounting for rebuilt coal cars, requiring that the cars manufactured from used material (re-conditioned where necessary) be charged as new equipment. In accounting for the retirement of the equipment involved, charges to operating expenses and accrued depreciation reserve are to be based on the ledger value or original cost of the retired units.

Firemen's Brotherhood Endorses Five-Day Week Bill

Arthur J. Lovell, vice-president of the Brotherhood of Locomotive Firemen and Enginemen, testified before a Senate committee on January 10 in support of a bill introduced by Senator Black, of Alabama, to prohibit the interstate transportation of goods produced by companies that do not adopt the five-day week and six-hour day. Although the bill as introduced does not apply to railway employees he went into detail regarding the extent of unemployment among railway employees, saying that the number of railroad employees had been reduced by some 350,000 before the depression and that many were now unemployed who had devoted their lives to the service.

Illinois Terminal Passenger Station at St. Louis Opened

The Illinois Terminal (electric) Railroad has opened its passenger station in the recently completed Illinois Terminal building at 710 North Twelfth boulevard, St. Louis, Mo., the project being one of the largest completed in that city during the past year. The offices are located on the ground floor level and passengers are carried to and from the train tracks in the subway, about 30 ft. below, by an elevator. The mezzanine floor has been converted into a public garage with accommodations for about 200 automobiles and the motor coaches of the railroad. In the waiting room there is a public annunciator system for announcing the arrival and departure of trains and the motor coaches; and an extension of the system conveys the announcements to every public part of the nine-story building. The passenger train platform has a capacity for 28 cars, while the freight platforms accommodate about 50 cars and contain bays where 45 automobile trucks may be backed up to pick up or deposit freight.

Lehigh Valley Spreads Work

E. E. Loomis, president of the Lehigh Valley Railroad, has notified Alfred P. Sloan, Jr., chairman of the Share-the-Work Movement in the Second Federal Reserve District, that employment on the Lehigh has been considerably increased with adoption of the job-spreading plan. The road's personnel now numbers 13,726, Mr. Loomis reported, noting that 2,500 engineers, firemen and trainmen have agreed upon individual limitation of monthly mileage, so as to put more men on runs.

"In our shops, employing about 4,000 men," Mr. Loomis said, "we have worked the average force three days a week in preference to working a part of the force five days a week, thereby increasing the number of men on the pay roll. In the maintenance of way department, comprising about 2,500 men, the same practice of working the full force three days of the week rather than working a small force for six days a week has been followed."

Negotiations are pending for similar arrangements with telegraphers and other groups of employees. It has not been found practicable to apply the entire plan to clerical and station forces but some modification, designed to spread such work as far as possible, is contemplated.

Higher Switching Charges Proposed in Texas

Following the filing of a petition by the Missouri-Kansas-Texas, the Texas & Pacific, the Texas & New Orleans, the St. Louis Southwestern and the Dallas Terminal, seeking authority to establish a reciprocal switching charge of $8.10 per car on intrastate traffic at Dallas, Ft. Worth, Waco and Wichita Falls, the Railroad Commission of Texas, in co-operation with the Interstate Commerce Commission, will hold a hearing on January 18 to determine whether such rate is proper and equitable. The present intrastate switching charges at the four Texas points are based upon the graduated mileage scale of $1.80 per car for distances of one mile and less, $2.25 per car for distances of two miles and over one mile and $3.15 per car for all distances over two miles.

The carriers contend that switching performed at the four points under the graduated mileage scale is substantially below the cost of the service, and that all carriers are entitled to compensation therefor on the basis of the cost plus a reasonable rate of return. Studies made reflect a cost to the applicant lines at the four points in excess of $8.10 per car, but they decided to publish this figure for the sake of uniformity, this being the charge now in effect in several large terminals in Texas.

Employee Movement Spreads to Argentina

Employees of the Buenos Aires Western have formed an association similar to the "ship-by-rail" organizations in North America, the function of which is to promote patronage of the line. The association is known as "The 11,171 Club" (that being the number of its original membership). Headquarters are maintained at Once de Septiembre Station, Buenos Aires, and a monthly information bulletin is published. Local clubs affiliated with the Buenos Aires organization are being formed at many points.

The first three issues of this bulletin indicate some of the club's activities. There is an executive committee, one on rates, one on transportation and three on public relations and publicity. The Buenos Aires Western, a privately-owned road, faces competition not only from motor vehicles but also from the Province of Buenos

Aires government railway, which charges lower rates than the Western Line and meets its deficits out of taxation. The 11,171 Club urges its members to work for a parity of rates between the government line and its private competitor for the relief of the taxpayers. The club is also working for an adequate curb on motor transport competition, and in stimulating the consumption of products—notably potatoes—shipped by the patrons of the railway.

The club also solicits suggestions for increasing traffic and efficiency which, after being approved by the proper committee, are referred to the management.

President Urges Legislation for Relief of Debtors

Legislation at this session of Congress for the relief of individual and corporate debtors by a plan for voluntary reorganization or readjustment of debts without bankruptcy and receivership proceedings was strongly urged by President Hoover, in a special message to Congress on January 11, as a matter of most vital importance. He said the provisions of the proposed legislation dealing with corporate reorganization should be applicable to railroads and that in such cases the plan of reorganization should not become effective until it has been approved by the Interstate Commerce Commission, but otherwise he did not refer to the railroad situation. This matter, he said, "has a major bearing upon the whole economic situation in the adjustment of the relation of debtors and creditors," and he recommended its immediate consideration as an emergency action.

The Interstate Commerce Commission is working on a report to be submitted to the Senate judiciary committee in connection with its consideration of legislation to provide for voluntary financial reorganizations of railway companies without the expensive and protracted process of receivership. Solicitor General Thacher is working on a bill for the purpose, with a joint sub-committee of the Senate and House judiciary committees, which is to be introduced by Senator Hastings as a substitute for a similar bill introduced at the last session, and many conferences are being held among those interested in the subject, although it is not expected that much progress will be made at the present short session of Congress.

Norfolk & Western Uses Cab Signals

The Interstate Commerce Commission, on petition of the Norfolk & Western, has modified the requirements of its automatic train control orders of 1922 and 1924 to permit the operation on that road between Roanoke, Va., and Hagerstown, Md., of locomotives equipped with automatic cab signals in lieu of automatic train control. Commissioner Aitchison dissented.

This line is 239 miles long; the first part was equipped with automatic train control on February 15, 1925, and the second part on March 16, 1928. The number of locomotives equipped is 79, which includes four of the Chesapeake & Ohio, which road runs trains over a nine-mile section of the line.

The expenditures for these installations, including locomotive equipment, have amounted to $750,899. The locomotive equipment includes a speed-limit indicator.

The cost of maintenance and operation is about $90,000 a year and with the discontinuance of the brake-setting apparatus the cost will be reduced by $9,800 yearly; and the change will put a stop to various other items of cost, especially those due to unnecessary stopping of trains because of undesired brake applications.

This is a single-track line through a thinly settled region. The traffic has suffered a great diminution, the average number of trains daily in July and August having been about 15 a day in both directions which is less than half the average number in the summer of 1924.

The use of the cab signal in lieu of automatic train control is approved on the addition of a second signal unit (for the fireman) and an audible signal or whistle, as called for in the specifications. A code of requirements is prescribed as in the case of the Union Pacific and other roads which have been granted similar authority to use cab signals instead of automatic train control.

S. P. of Mexico Employee Conflict Settled

The conflict between the Southern Pacific of Mexico and its employees, which brought about a strike extending from June 27 to September 23, 1932, has been terminated, 20 of the points at issue being settled in favor of the employees and 20 in favor of the company, while nine were decided to the advantage of both parties. The company was relieved from paying lost time to the strikers, but agreed to dismiss all foreigners from the service, with the exception of directors, and agreed not to reduce salaries. The conflict, instigated by Mexican workers and centering around conditions at Nogales yards in Arizona and Sonora (on both sides of the international border) arose over the employment of American men in Mexican territory.

As a result of this conflict and while the railway, the employees and the Mexican Board of Arbitration and Conciliation were endeavoring to end the strike, the Arizona Corporation Commission began an independent investigation (September 9) to determine whether the practices and methods of operation of the Southern Pacific in the transaction of its business at that point are convenient, comfortable and safe, and whether they reasonably guarantee the preservation of the health of the employees and patrons of the company. As a result of this investigation, the commission on December 30 ordered the railway, unless it fully conformed to and complied with all the provisions of Section 657 of the revised code of Arizona, 1928, to cease transacting business in the state of Arizona; and that effective February 1, 1933, the parent company and its subsidiary should employ in engine and train service in the Nogales, Ariz., yard only men who are able to read, write, speak and understand the English language.

The report of the commission points out that restrictions on the employment of Mexicans and Americans were brought about as a result of the passage of a law by the Mexican government that finally became effective in the latter part of 1931, which provides that the employees on Mexican railways, with the exception of those in positions of "direction, supervision and technology," shall be 100 per cent Mexican. Previous to that time, persons of all nationalities had been employed indiscriminately on either side of the line.

N. T. C. To Continue Along Lines Laid Out by Calvin Coolidge

Meeting in New York on January 9 and 10 for the first time since the death of its chairman—former President Calvin Coolidge—the National Transportation Committee decided to continue its work along the lines laid out by Mr. Coolidge. The chairmanship will remain vacant and the committee's activities will henceforth be under the direction of the vice-chairman, Bernard M. Baruch.

All the basic work of the committee has been completed and the necessary hearings have been held so there remains but the preparation of the final report to the sponsoring organizations. When the report will be completed, Dr. Harold G. Moulton, the committee's chief investigator, was unable to say.

Commenting upon the death of Mr. Coolidge, Mr. Baruch said:

"The sudden death of Calvin Coolidge brings a shock to the country. It comes with peculiar poignancy to me especially on account of our recent close association with him in the National Transportation Committee, to which he gave full measure of his great ability and his usual devotion to any public duty. The committee has completed its hearings and is approaching the end of the program laid out by him. It will carry on to a conclusion in the spirit in which he led it and in a manner which we all hope and believe would have had his full approval."

Clark Howell, publisher of the Atlanta Constitution and another member of the National Transportation Committee, was delegated to draw up and send to Mrs. Coolidge the committee's resolutions of sympathy and condolence. Other members of the committee are former Governor Alfred E. Smith of New York and Alexander Legge, president of the International Harvester Company.

Former Commissioner Lewis Appointed Director of Valuation

As briefly reported in last week's issue, the Interstate Commerce Commission on January 6 announced the appointment of Ernest I. Lewis, whose term as commissioner expired on December 31, as director of valuation, succeeding C. F. Staples, who died last summer. The Senate had failed to confirm the President's reappointment of Commissioner Lewis for another term, which had been sent to the Senate early in December, under the policy adopted by the Democratic leaders of holding such positions which may be filled by the appointment of Democrats after March 4. Commissioner Lewis is a Republican.

In making the announcement the commission said that Mr. Lewis had been in charge of the valuation work of the com-

mission since 1921 and had been the actual director of its valuation activities during the illness and after the death of Mr. Staples, and that, the primary valuations having been completed, the important work of bringing to date all inventories and underlying records, including those of original cost and investment, is being pushed. Mr. Lewis had been chairman of the Indiana Public Service Commission and was appointed a member of the Interstate Commerce Commission by President Harding on April 27, 1921. He was reappointed by President Coolidge in 1925 and was chairman of the commission for the year 1929.

Even before the expiration of Commissioner Lewis' term the legislature of the state of Mississippi had made a bid for his office for C. M. Morgan, chairman of the Mississippi State Railroad Commission, by sending to Congress a memorial urging the members of Congress from that state to use their influence with the incoming Democratic administration for his appointment.

Federal Ownership, Private Operation

(*Continued from page 48*)

management, there being no competition in rates between any such portions as might be thus leased or such portions as might be operated under the immediate direction of an operating department of the Authority. The Authority also should have power after a period of one year to dispose of terminal or other properties not found necessary to the economic and efficient provision of fullest transportation service, and, in acquiring railroad properties, it should have or acquire all the powers now held by any railroad corporation whose property it shall acquire.

"I know my judgment is not in accord with the general impression, and even strong conviction, of bankers and railroad officials, but I am none the less positive that the improved conditions of the railroads following 1920 were largely due to the greater efficiency possible under unified control of all the railroads.

"There are 240,000 stockholders of one great railroad alone, of whom 70,000 are women, with an average of a very few shares each. The nomination of directors who select the executives is made by banking interests, which have in the aggregate probably not 1 per cent of ownership; their relation is purely one of fiduciary trust. When one considers that these same banking interests have as responsible a fiduciary relation to owners of bonds and stocks of steel, locomotive, car and other manufacturing corporations supplying the railroads, one discovers at once the utter impossibility of any dominant consideration of the public's rights in the management of these railroads. The condition has grown up without thought or plan, and the bankers are themselves the victims of this complex situation.

"There has been during the past decade another most vital factor in the matter of railroad administration and finance. I refer to the vast amount of money invested by and at the instance of the federal government in waterways and highway competition with the railroads. It is doubtless true that this provision of tax-exempt competition has been due to a very real extent to the logical lobbying, through farm and other organizations, of the great automobile industry. I refer to this because it indicates the impossibility of a maintenance of proper standards of railroad efficiency by private capital, which is quite without resource to overcome such new competition from invention, improvements, or otherwise."

Rivers and Harbors Congress Opposes "Equality of Opportunity"

The officers of the National Rivers and Harbors Congress have filed with the National Transportation Committee a lengthy statement replying to that of the Association of Railway Executives which urged the committee to recommend legislation which would provide an equality of opportunity between the railways and competing agencies of transportation. They admit that the railway industry is in a "serious condition" but ask "is it not highly probable that the public interest will be promoted by some fundamental reorganization of our railways, rather than by enacting legislation which will enable them to destroy their competitors?" In conclusion the statement says:

"Over and over again, in recent months, we have been told that all the railways want is 'equality of opportunity.' That is a fine, high-sounding phrase, and one calculated to call up rosy visions of equity, fair dealing and scrupulous regard for the rights of others. The reality that lies behind, in this case at least, wears a decidedly different aspect.

"On the one hand we have a railway system with 250,000 miles of inter-connecting lines and enormous financial resources. On the other hand, we have 25,000 miles of nominally navigable waterways, few of which have dependable channels and many of which are entirely isolated. Transportation on these waterways is conducted by individuals or small independent companies with extremely limited capital. As a rule, a boat line must meet railway competition over every mile of its route, while the competing railway operates thousands of miles of line which have no water competition whatever.

"Now, in the name of 'equality of opportunity,' the roads are asking that these struggling water lines, already hard hit by the depression, shall be burdened with increased taxes and hampered by unnecessary regulations; that hard-won protective legislation shall be repealed; that much of the discretionary power of the Interstate Commerce Commission shall be taken away; and that, wherever and whenever they find a boat line getting any business whatever, they shall be perfectly free to make, and put into immediate effect, a rate which is low enough to take that business away from the water and give it to the rails.

"There are many who are supporting the railway proposals under a misapprehension. That word 'equality' looms so large that they do not take in the meaning of the entire phrase, which is something radically different. Can it be denied that, when a pack of wolves and a flock of sheep come together, out in the open country, the two lots of animals have an absolute 'equality of opportunity'? Are not the sheep just as free to fight, or to run, as are the wolves? And can it be denied that, if the railroads shall be granted all the legislation they are asking for, the waterways (and the highways too) will be just as helpless as is a flock of sheep when attacked by a pack of wolves? (The comparison, of course, touches only one phase of railroad activities. The roads perform an indispensable service to the Nation, but are very "ungentle" to competitors.)

"Owners of sheep care nothing at all for 'equality of opportunity.' What they are interested in is protection from predatory animals so they may continue to receive profits from the products of their flocks. Neither are the people of the United States interested in 'equality of opportunity.' The amount invested in highways and highway transportation added to that invested in waterways and water transportation is far greater than the investment in railroads. What they are interested in, therefore, is proper protection for these two forms of transportation, in order that they, as well as the railroads, may be fostered and preserved in full vigor for the service of the Nation and its people."

Transport Legislation Sidetracked in Congress

(*Continued from page 48*)

buttal of the testimony given by the railway labor organizations, and the hearing was concluded on the following day. If the committee should decide to give serious attention to the bill the railroads would be given an opportunity to be heard.

No hearings are to be held by the House committee on the railroad pension bill, although a sub-committee of the Senate committee had agreed to give a hearing on the Wagner bill on January 11.

Chairman Rayburn of the House committee, and Senator Pittman, ranking Democratic member of the Senate committee on interstate commerce, were among the Congressional leaders who conferred with President-elect Roosevelt on a legislative program on January 5 but no announcement was made on the subject of transportation. It is understood that if an extra session is called both committees would be prepared to take up various transportation proposals, and they would at that time have before them the recommendations to be made by the National Transportation Committee of which Calvin Coolidge was chairman.

Henry I. Harriman, president of the Chamber of Commerce of the United States, has addressed a letter to all members of Congress urging the importance of the enactment of H. R. 11642, which proposes the retroactive repeal of the recapture clause of the interstate commerce act and also a modification of the provisions relating to railway valuation. The letter calls attention to the recent referendum of the membership of the National Chamber in which recommendations for such legislation were approved by over 2,000 votes, with very few against, and says in part:

"The organizations of business men for which I am commissioned to speak are convinced that the adoption of the policies thus outlined would have a most salutary effect in the present emergency as well as put into effect sound permanent policies with respect to these features of railway regulation.

"The retroactive repeal of the recapture clause would not entail a single dollar of cost to the government, and it would relieve our railroads of a liability estimated by the Interstate Commerce Commission to be approximately $360,000,000. In its future aspects, the repeal of recapture would favorably affect the credit of many carriers. Moreover, the adoption, at this session, of legislation substantially embodying the recommendations of shipper interests, the Interstate Commerce Commission and the railroads would, we believe, be of definite assistance in bringing about that degree of confidence which is absolutely essential to business recovery.

"We are, therefore, convinced that a proper consideration of the public interest indicates the desirability of favorable action, this session, upon this pending legislation. We are likewise convinced that such legislation should be dealt with independent of proposals which are of a controversial character, and that it is eminently desirable that the legislation be given immediate consideration upon its merits."

Mr. Harriman has also addressed a letter to the members of the National Chamber pointing out that if these proposals are to have the immediate consideration they deserve it will be necessary that Congress realize the public interest in them. He suggested that it would be most timely for each organization to communicate its views at once to Senators and Representatives.

Railway Deficit Being Reduced

Class I railways in the United States had a net income of $20,188,770 after payment of fixed charges in October, which reduced their net deficit for the first ten months of 1932 to $147,078,678, according to the Interstate Commerce Commission's monthly compilation of selected income and balance-sheet items. For the eight months ended with August the net deficit was $173,892,660 but in September this was reduced by a net income of $6,384,811 and a further reduction occurred in October, although it has been estimated that the deficit for the year would approach $200,000,000. For the ten months period the net railway operating income was $267,767,349, as compared with $475,302,568 in the corresponding period of 1931 and the other income was $162,777,192, as compared with $206,804,005. Total deductions, however, were greater in 1932, amounting to $577,623,219, as compared with $571,979,064 in the corresponding period of 1931. The net deficit for the ten months compares with a net income for ten months of 1931 of $110,127,509. The summary for October and ten months is given in the accompanying table.

End Government Doles to Special Groups, says Williamson

The railroad tax dollar is expended by governing bodies for many purposes from which the railroads themselves not only receive no direct benefit, but which in many instances are inimical to their welfare, said F. E. Williamson, president of the New York Central in a recent statement discussing the tax situation as it affects the railroads. Mr. Williamson also emphasized the necessity of reducing, by broadening the base of the tax structure, taxes produced by levies on real property.

"As the largest single corporate taxpayers in the country," he said, "the railroads have a vital interest in the present tax situation. In nearly every state traversed by the New York Central, this railroad is the largest individual taxpayer. Its taxes this year, although lower than heretofore, will total more than $32,000,000.

"A recent study made by an educational foundation developed the fact that over $6,000,000 a day is paid in governmental doles for the benefit of various special interests. It is the first law of business that commercial projects shall be self-sustaining if they are to endure. I believe the time has come for us to consider whether fairness to the taxpayers of the country does not require that those relatively small sections of our population which now enjoy special privileges at the expense of the whole body of taxpayers, should not be asked to pay their way, as business projects in general have to do.

"I can see no reason why the government-owned Inland Waterways Corporation and all inland waterway operations should not be put on a self-sustaining basis and thus end the millions now received in doles from the taxpayers. On the Mississippi river waterway, the study shows that shippers pay about 40 per cent of the cost of the service, and the taxpayers, in general, pay 60 per cent. I cannot see why air mail transportation should not be put on a self-sustaining basis and thus end a large part of the loss sustained annually by the Post Office Department. The Postmaster General said, in June, 1931: 'The postage which you attach to your air mail letters defrays less than half the actual cost.' Similarly I can see no reason why the cost of building and maintaining highways should not be borne by those who use them. According to this study, out of a total annual 'rural highway' operating cost of 2,247 million, 862 million dollars from motor vehicle fees and gasoline taxes, or 38 per cent, is paid by users, and 1,385 million dollars is paid by taxpayers.

"More than fifty per cent of the traffic through the Panama canal is foreign shipping. Why should not the canal tolls be

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS IN THE UNITED STATES

Compiled from 160 reports (Form IBS) representing 165 steam railways, including 17 switching and terminal companies

TOTALS FOR THE UNITED STATES (ALL REGIONS)†

For the month of October		Income Items	For the ten months of	
1932	1931		1932	1931
$63,932,341	$64,430,045	1. Net railway operating income	$267,767,349	$475,302,568
14,663,298	17,288,241	2. Other income	162,777,192	206,804,005
78,595,639	81,718,286	3. Total income	430,544,541	682,106,573
11,478,815	11,015,364	4. Rent for leased roads	110,648,429	110,501,992
45,082,303	44,270,263	5. Interest deductions	445,994,001	441,045,990
1,845,751	1,928,010	6. Other deductions	20,980,789	20,431,082
58,406,869	57,213,637	7. Total deductions	577,623,219	571,979,064
20,188,770	24,504,649	8. Net income	*d*147,078,678	110,127,509
		9. Dividend declarations (from income and surplus):		
42,131	429,962	9-01. On common stock	54,582,779	213,225,847
1,143,881	869,591	9-02. On preferred stock	14,436,791	43,322,511

BALANCE-SHEET ITEMS

Selected Asset Items

	Balance at end of October	
	1932	1931
10. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$770,821,902	$825,287,704
11. Cash	340,836,344	399,853,036
12. Demand loans and deposits	37,668,037	50,243,510
13. Time drafts and deposits	33,776,394	63,757,356
14. Special deposits	29,182,519	43,744,357
15. Loans and bills receivable	11,864,321	12,346,963
16. Traffic and car-service balances receivable	56,038,418	70,164,933
17. Net balance receivable from agents and conductors	45,016,433	49,386,914
18. Miscellaneous accounts receivable	146,558,535	169,834,423
19. Materials and supplies	324,764,342	381,718,385
20. Interest and dividends receivable	40,452,687	42,716,482
21. Rents receivable	3,395,910	6,087,319
22. Other current assets	9,378,331	13,539,422
23. Total current assets (Items 11 to 22)	1,078,932,271	1,303,393,100

Selected Liability Items

24. Funded debt maturing within six months*	171,192,065	82,265,966
25. Loans and bills payable	280,285,113	230,383,455
26. Traffic and car-service balances payable	74,317,646	93,748,899
27. Audited accounts and wages payable	207,248,040	263,797,585
28. Miscellaneous accounts payable	79,252,644	72,452,377
29. Interest matured unpaid	167,789,411	150,718,875
30. Dividends matured unpaid	4,734,007	11,980,410
31. Funded debt matured unpaid	50,971,674	41,605,003
32. Unmatured dividends declared	882,631	11,514,888
33. Unmatured interest accrued	111,745,192	110,161,130
34. Unmatured rents accrued	34,525,360	34,468,611
35. Other current liabilities	18,678,808	23,278,397
36. Total current liabilities (Items 25 to 35)	1,030,430,526	1,044,109,630

† Complete data for the following Class I railways not available for inclusion in these totals: Canadian National Lines in New England, Canadian Pacific Lines in Maine, and Canadian Pacific Lines in Vermont.

* Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

d Deficit.

revised upward? The Governor of the Panama canal recently recommended a tolls revision for more revenue, but the proposition was defeated.

"These suggestions, if put into effect, offer an almost immediate means of relief for the general taxpayer. For the railroads, some relief in taxation is imperative. If their usefulness as taxpayers to the communities they serve is not to be destroyed, this fact must be recognized."

Full-Crew Hearings Concluded

Hearings on the Shallenberger full-crew bill, advocated before the House Committee on interstate and foreign commerce by the railroad labor organizations, were brought to a close on January 6, although the labor organizations had other witnesses they desired to present; and the committee has decided not to hear testimony in opposition to the bill unless it decides later that the bill is to be seriously considered for action at this session of Congress.

The concluding testimony was given by J. A. Farquharson, national legislative representative of the Brotherhood of Railroad Trainmen, and consisted largely of a discussion of accident report statistics of the Interstate Commerce Commission showing the various classifications of accidents to trainmen which he said could be greatly reduced if so many trains were not undermanned. He gave credit to the railroads for every effort to improve their equipment but said that additional employees, particularly brakemen, are needed to afford lookout protection and pass signals and he said that the ratio of casualties to the volume of traffic has generally been maintained in spite of all efforts of the companies and of the employees. He emphasized the additional hazards which he said had been created by the constant increase in the length of trains and averred that under present conditions railroads have so reduced their crews as to cause very unsafe conditions. Trains with as many as 185 cars, he said, are being operated with two brakemen.

When pressed by the committee for some idea of the number of additional employees that would be required by the terms of the bill he estimated that it might require an increase of about 40 per cent in the number of brakemen, or possibly more, as compared with the present reduced crews, although he said that many railroads are now employing the required number, either by agreement or because of state laws. After stating that the railroads in eleven years had spent $81,000,000 for the cost of clearing wrecks and $401,000,000 for injuries to persons, he ventured the statement that a full-crew law would not cost them any more than that amount plus the cost of overtime that would be saved, although he could not attempt to estimate the exact cost of complying with such a law. To give some idea he said that the wages paid to brakemen in August, 1932, amounted to $10,341,208.

When members of the committee asked if statistics were not available showing the relation between the number of accidents and the length of trains, or in states which have full-crew laws and those which do not, Mr. Farquharson and Donald R. Richberg, counsel for the organizations, said that it would be difficult to draw clear conclusions from statistics because of the variations in operating conditions, but that in Arizona, where there is a full-crew law and a train-limit law prohibiting trains of over 70 cars, conditions are better than in other states.

In conclusion Mr. Farquharson argued that the added cost must not enter into the consideration of the question when it is shown that accidents are being caused because trains are undermanned; and he hoped the committee would not allow the cost to cause them to lose sight of the human question.

Supply Trade

Frank A. Nelson has been appointed traffic manager of the **Long-Bell Lumber Sales Corporation,** Kansas City, Mo., to succeed **R. S. Davis,** deceased. Mr. Nelson, whose entire business experience has been in the railroad field, joined the Long-Bell organization in 1917 as chief clerk of the traffic department. In 1920 he was made traffic manager of several Long-Bell railroads in the South.

Sales of the **Agasote Millboard Company's** products in the railroad and marine field will continue to be handled by the **Pantasote Company, Inc.,** 250 Park avenue, New York, under the management of **William A. Lake,** but all orders or contracts for Millboard products will henceforth be subject to acceptance by the Agasote Millboard Company, since all contracts are to be directly between the latter company and the customer. The Agasote Company will also handle such sales details as the acknowledgment of orders, invoicing and collections at its main office in Trenton, N. J., where its plant is located.

Supplementary letters patent have now been issued putting into effect a plan of reorganization of the capital structure of the **Canadian Locomotive Company, Limited,** Kingston, Ontario. This plan was unanimously approved at a meeting of shareholders held at Kingston on December 28, when a board of directors was elected, consisting of **William Harty, William Casey** and **J. A. McDonald,** of Kingston; **William F. Angus, G. M. Todd** and **Edward W. FitzGerald,** of Montreal; and **Col. H. D. L. Gordon** of Toronto. Also at this meeting Mr. Casey was elected president of the company and Mr. Harty, chairman of the board.

OBITUARY

William J. McCarroll, formerly assistant to the senior vice-president of the Baldwin Locomotive Works, died on December 31 at his home at Melrose Park, Pa., at the age of 72. Mr. McCarroll retired in 1928. For many years he was foreign representative of the Baldwin Locomotive Works and passed a considerable part of his life in Russia and Italy.

Equipment and Supplies

FREIGHT CARS

THE CALIFORNIA DISPATCH LINE has ordered three tank cars of 10,000 gal. capacity from the American Car & Foundry Company.

IRON AND STEEL

THE DENVER & RIO GRANDE WESTERN has ordered 1,500 tons of structural steel for bridge work from the American Bridge Company.

SIGNALING

ST. LOUIS-SAN FRANCISCO.—The receivers have petitioned the Interstate Commerce Commission for relief from the orders issued in 1922 and 1924 requiring the maintenance and operation of automatic train control between Nichols, Mo., and Afton, Okla.

Construction

MARIANNA & BLOUNTSTOWN.—The Interstate Commerce Commission has extended until April 1, 1933, the date on or prior to which this company must begin the construction of two connecting lines heretofore authorized.

MONTOUR.—A contract has been awarded to the Winston Brothers Company, Pittsburgh, Pa., for the grading for two miles of line near Negley, Ohio, as part of a proposed project involving the construction of 13 miles of track between Negley and Smith's Ferry, Pa. This contract involves approximately 100,000 cu. yd. of excavation.

Construction Dates Advanced

The Interstate Commerce Commission has advanced the dates when, under outstanding authorizations, various projects for the construction of extensions should be completed, as follows:

Railroad and Project	Completion Date Extended To
Houston & Texas Central	
Branch in Harris Co., Tex.	Dec. 31, 1933
Yankton, Norfolk & Southern	
Line in S. D.	Dec. 31, 1933
Ozark & Philpott	
Line in Franklin Co., Ark.	Dec. 31, 1933
Quebec Extension	
Line Aroostook, Co., Me.	Dec. 31, 1934*
North & South	
Line in Mont. and Wyo.	Dec. 31, 1934*

* Permitted to retain excess earnings ten years after completion of line up to 1944.

THE LIBRARY of the Bureau of Railway Economics, Washington, D. C., has compiled a list of references on store door delivery. The list, which is chronologically arranged, covers the period from 1912 to date and contains approximately two hundred references.

Financial

DELAWARE & HUDSON.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue and reissue from time to time $7,750,000 of 6 per cent promissory notes, to be used in part in payment of outstanding notes and for other corporate purposes.

DENVER & RIO GRANDE WESTERN.—*Acquisition of D. & S. L.*—The Supreme Court of the United States on January 9 announced that "probable jurisdiction" had been noted in the suit of the Moffat Tunnel League and others to vacate the order of the Interstate Commerce Commission authorizing the Denver & Rio Grande Western to acquire control of the Denver & Salt Lake.

LEHIGH VALLEY.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $1,000,000 of general consolidated mortgage 4½ per cent bonds, to be pledged as collateral security for short term notes.

LOUISIANA, ARKANSAS & TEXAS.—*R. F. C. Loan.*—This company has withdrawn its application to the Reconstruction Finance Corporation for a loan of $685,756 and the application has been dismissed.

MISSOURI PACIFIC.—*R. F. C. Loan.*—The Interstate Commerce Commission has approved a further loan of $2,500,000 to this company from the Reconstruction Finance Corporation for the purpose of paying taxes and the principal of equipment trust obligations. Loans aggregating $17,100,000 had been made to the company previously.

NEW YORK CENTRAL.—*Acquisition of C. A. & S.*—The Interstate Commerce Commission has granted this company's petition for a rehearing in the case in which it found that the acquisition of the Chicago, Attica & Southern at a commercial value of $165,000 would be in the public interest and has assigned it for hearing at Washington on January 30 before Examiner Walsh.

READING.—*Equipment Trust.*—The Interstate Commerce Commission has modified its order in respect to equipment trust certificates of this company, series N, to permit a reduction from $1,800,000 to $1,080,000 in the amount, withdrawing 10 Santa Fe type freight locomotives from the trust and providing for the payment of the remaining $1,080,000 in 12 semi-annual installments of $90,000 each from June 1, 1933, to December 1, 1938, reducing the term of the trust from 10½ years to 6½ years. The certificates are authorized for sale to Dillon Read & Company at 100.725, making the average annual cost approximately 4.75 per cent.

ST. LOUIS-SAN FRANCISCO.—*Interest On R. F. C. Loan Not Paid.*—The secretary of the Reconstruction Finance Corporation has advised the Interstate Commerce Commission that the interest due on November 6 in the amount of $27,221 on a loan of $1,800,000 has not been paid. It is stated that the receivers are awaiting a court order authorizing the payment.

ST. LOUIS-SAN FRANCISCO.—*Final Valuation As of 1918.*—The total final value for rate-making purposes of the properties of the St. Louis-San Francisco and 19 subsidiary or affiliated companies used for common-carrier purposes as of 1918 was placed at $209,446,179 in a final valuation report made public by the Interstate Commerce Commission. The books of the St. Louis-San Francisco, the controlling company, record an investment in road and equipment on valuation date of $249,403,243, which if adjusted as suggested by the Bureau of Valuation would become $235,969,564. Of this amount, the report says, $14,857,730 represents recorded money outlay and the remainder consists mainly of securities issued or assumed, or other stated liabilities. The final value for the St. Louis-San Francisco itself was placed at $136,670,000.

SEABOARD AIR LINE.—*R. F. C. Loan.*—The Interstate Commerce Commission has approved a loan of $1,500,000 from the Reconstruction Finance Corporation to the receivers, the proceeds to be applied in payment of claims which have been adjudged by the court having jurisdiction of the receivership to be entitled to priority of payment. The commission had previously denied an application for $3,000,000. Commissioner Mahaffie dissented, saying he was unable to join in the finding that the loan would be adequately secured.

TOLEDO, ANGOLA & WESTERN.—*R. F. C. Loan.*—The Interstate Commerce Commission has approved a loan of $21,000 to this company from the Reconstruction Finance Corporation, on its application for $36,000.

Average Prices of Stocks and of Bonds

	Jan. 10	Last week	Last year
Average price of 20 representative railway stocks..	26.70	23.53	34.63
Average price of 20 representative railway bonds..	58.94	56.48	70.75

Dividends Declared

Delaware R. R. Co.—$1.00, semi-annually, payable July 1 to holders of record June 15.

Louisville, Henderson & St. Louis.—$4.00, semi-annually; Preferred, $2.50, semi-annually, both payable February 15 to holders of record February 1.

Northern R. R. of N. H.—$1.50, quarterly, payable January 31 to holders of record January 4.

Pittsburgh, Bessemer & Lake Erie.—Common, 75c, quarterly, payable April 1 to holders of record March 15; 6 Per Cent Preferred, $1.50, quarterly, payable June 1 to holders of record May 15.

Stony Brook.—$3.00, semi-annually, payable January 5 to holders of record December 31.

Virginian.—Preferred, $1.50, quarterly, payable February 1 to holders of record January 14.

Tentative Valuation Reports

The Interstate Commerce Commission has issued tentative valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes as of the respective valuation dates as follows:

Waterville	$ 52,000	1927
Winchester & Western	420,000	1927
Apache	1,300,000	1927
California & Oregon Coast	290,000	1927
Osage	390,000	1927
Eastland, Wichita Falls & Gulf	600,000	1927
Reader	225,000	1927
Kansas & Oklahoma	110,000	1927
Barre & Chelsea	470,000	1927
Strouds Creek & Muddlety	166,417	1927
Twin Branch	14,000	1927
Rock Island Southern	1,040,000	1927

Railway Officers

EXECUTIVE

Henry W. Anderson has been appointed co-receiver of the Seaboard Air Line, succeeding **E. W. Smith,** resigned.

FINANCIAL, LEGAL AND ACCOUNTING

W. F. Bull, assistant secretary of the Southern Pacific, has been appointed secretary to succeed **Hugh Neill,** deceased. **H. J. Carroll** will continue as assistant secretary, with assignment to duties heretofore performed by Mr. Bull.

D. J. Bond, comptroller of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been appointed also to the same position on the Duluth, South Shore & Atlantic and the Mineral Range (which are operated by the Soo Line), succeeding **A. E. Delf,** who has been appointed auditor, with headquarters as before at Marquette, Mich. The following officers of the Soo Line, all having headquarters at Minneapolis, have also been appointed to the same positions on the D. S. S. & A. and the Mineral Range: **A. E. Hancock,** assistant comptroller; **P. J. Stock,** assistant to comptroller; **F. E. Dooley,** auditor of valuation; **J. B. Donnelly,** auditor of capital expenditures; **J. R. Chapman,** auditor of disbursements; and **Fred L. Hallen,** auditor of payrolls. Previous to these appointments, the personnel of the two lines did not include officers with the above titles. **B. Newhouse,** general auditor of the Soo Line, at Minneapolis, has been appointed also auditor of revenues of the D. S. S. & A. and the Mineral Range.

Charles A. Magaw, general attorney of the Union Pacific Railroad for Nebraska and Iowa, with headquarters at Omaha, Neb., has been promoted to general solicitor, with the same headquarters, to succeed **N. H. Loomis,** who has retired. **T. W. Bocks,** assistant general attorney for Nebraska and Iowa, at Omaha, has been advanced to general attorney for these states to succeed Mr. Magaw.

Mr. Loomis has been connected with the law department of the Union Pacific for 48 years. He was born on June 28, 1862, at Highgate, Vt., and received his legal education at Missouri Valley college, Marshall, Mo., and Hastings college, Hastings, Neb. He entered railway service with the Union Pacific in 1885, as a stenographer and law clerk at Lawrence, Kan., being transferred to Topeka, Kan., two years later. Shortly thereafter he was appointed local attorney and assistant to the general counsel at Wyandotte, Kan., and in 1891, he was advanced to assistant general attorney at Topeka. Eleven years later, Mr. Loomis became general attorney at Topeka, and in 1908, he was further promoted to general solicitor at Omaha, which position he continued to hold until his retirement, with the exception of a period during the World war, when he served as corporate counsel.

OPERATING

A. L. Coey, superintendent of the Los Angeles & Salt Lake, has had his headquarters moved from Salt Lake City, Utah, to Los Angeles, Cal.

J. S. McAdam, assistant superintendent of the St. Lawrence division, with jurisdiction over the Cornwall subdivision, of the Canadian National, has retired, and that position has been assigned to **W. G. Doherty,** hitherto assistant superintendent at Hamilton, Ont. **E. W. Cameron** has been appointed assistant superintendent at Hamilton succeeding Mr. Doherty.

TRAFFIC

John M. Kerans has been appointed general agent in New England for the Delaware, Lackawanna & Western, succeeding **James A. Leary,** deceased. Mr. Kerans will have headquarters at Boston, Mass.

Howard J. Thomas, commercial agent at Chicago for the Midland Valley, the Kansas, Oklahoma & Gulk and the Oklahoma City-Ada-Atoka, has been promoted to general agent at the same point, to succeed **Roy C. Krueger,** deceased.

Daniel M. McNamara, assistant general passenger agent for the Alton, at St. Louis, Mo., has been appointed also to the same position on the Baltimore & Ohio at that point, to succeed **George F. Scheer,** who has been assigned to other duties.

J. D. Whitmore, live stock agent on the Union Pacific, at Omaha, Neb., has been promoted to general live stock agent of the system, with the same headquarters, succeeding **D. E. Clark,** whose headquarters have been at Cheyenne, Wyo., and who has been appointed to the newly-created position of assistant general live-stock agent of the system, with headquarters at Portland, Ore.

George C. Stohlman, confidential secretary to the president of the Missouri Pacific, has been appointed general freight agent, with headquarters as before at St. Louis, Mo., to succeed **L. D. Nicholson,** assistant general freight agent, who has been assigned to other duties. **J. R. Duckworth,** assistant general freight agent at Omaha, Neb., has been transferred to Memphis, Tenn., to succeed **George F. Painter,** who in turn has been transferred to Omaha.

ENGINEERING AND SIGNALING

F. U. Mayhew, track supervisor on the Chicago Great Western, with headquarters at Oelwein, Iowa, has been promoted to division engineer of the Illinois-Iowa division, with the same headquarters, to succeed **T. W. Fatherson,** who has been transferred to the Minnesota division, with headquarters at St. Paul, Minn. Mr. Fatherson replaces **W. C. Groth,** who has been promoted to chief engineer at Chicago.

Lem Adams, engineer maintenance of way of the Union Pacific System, with headquarters at Omaha, Neb., who has been appointed chief engineer of the Union Pacific Railroad and of the St. Joseph & Grand Island, with the same headquarters, as noted in the *Railway Age* of January 7, has served in the engineering and maintenance of way departments of the Union Pacific System for more than 23 years. He was born on June 6, 1886, at Buda, Tex., and received the degree of bachelor of science in civil engineering from the Texas A. & M. college. In June, 1909, he entered the service of the Union Pacific System as a rodman on the Oregon Short Line, where he was appointed a draftsman a year later. In June, 1911, he was made an

Lem Adams

estimator and served in this position and as chief draftsman until March, 1916, when he was promoted to assistant division engineer. In 1917, Mr. Adams was appointed engineering accountant and a year later he became contract engineer. In 1919, he was transferred to the Union Pacific unit of the system with the title of special field engineer in the maintenance of way department, then being advanced to roadway assistant of the system at Omaha in April, 1920. On May 15, 1929, he was advanced to general supervisor maintenance of way of the system at Omaha, and, on September 16, 1931, he was appointed to the newly-created position of engineer maintenance of way of the system, which position he continued to hold until his recent appointment as chief engineer of the Union Pacific railroad.

OBITUARY

C. J. Chase, cost engineer of the Boston & Maine, died at Concord, N. H., on December 31, 1932, at the age of 49 years.

J. W. Blabon, formerly vice-president of the Great Northern, died at New York on January 10 of heart disease after a lingering illness.

James A. Leary, general agent in New England for the Delaware, Lackawanna & Western, with headquarters at Boston, Mass., died on December 25, at the age of 58 years.

Milford N. Wells, assistant engineer on the Southern Kansas division of the Atchison, Topeka & Santa Fe, at Chanute, Kan., who until 1911 was division engineer of this division, died on December 14 at the age of 89 years.

R. S. Davis, president and general manager of the Mississippi Eastern, vice-president and general manager of the Sibley, Lake Bisteneau & Southern, and traffic manager of the Longview, Portland & Northern, all of which roads are controlled by the Long-Bell Lumber Company, of which Mr. Davis was a director, died on December 21 at his home at Kansas City, Mo.

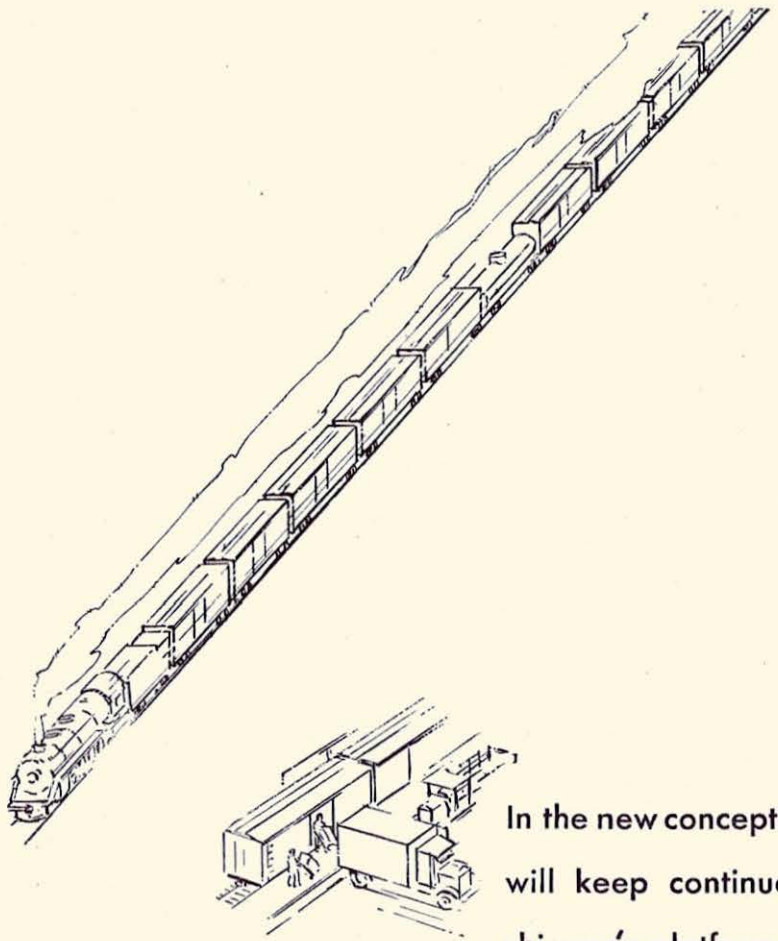
Strode P. Henderson, general manager of the Alton, who died January 1, as noted in the *Railway Age* for January 7, had been in railway service with various railroads for more than 41 years. He was born on September 11, 1874, at Rolling Prairie, Ind., and entered railway service in October, 1891, as a telegraph operator on the Louisville, New Albany & Chicago (now the Chicago, Indianapolis & Louisville), at Monticello, Ind. In June, 1893, Mr. Henderson left this company to go with the Chicago, Rock Island & Pacific as a telegraph operator at Rock Island, Ill., serving in this position and as a train dispatcher until October, 1899, when he became a train dispatcher on the Delaware, Lackawanna & Western at Hoboken, N. J. From September, 1902, until February, 1905, Mr. Henderson served successively as a dispatcher, chief dispatcher and trainmaster on the Chicago, Cincinnati & Louisville

Strode P. Henderson

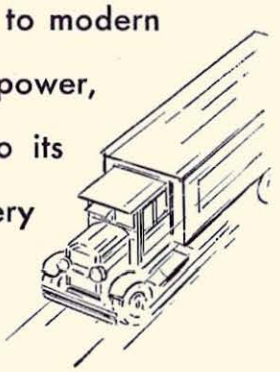
(now part of the Chesapeake & Ohio), and at the end of this period he went with the Buffalo & Susquehanna as superintendent at Galeton, Pa. In February, 1908, he was appointed a trainmaster on the Kansas City Southern at Mena, Ark., which position he held until August, 1910, when he entered the service of the Chicago & Alton (now the Alton), as a trainmaster at Bloomington, Ill. He was advanced to superintendent of the Northern division in October, 1912, and later served as superintendent of the Southern division. In May, 1927, Mr. Henderson was promoted to general superintendent, with headquarters at Bloomington, and in January, 1929, he became chief operating officer for the receivers. When this railroad was reorganized as the Alton in 1931, Mr. Henderson was appointed general manager in charge of operation and maintenance at Chicago, which position he held until his death.

Tables of Revenues and Expenses of Railways begin on next left-hand page

Win back lost traffic by better service . . .



In the new conception of railroad service, freight will keep continually on the move from the shipper's platform to the receiver's door. « This involves new methods of operation—co-ordination of motor truck and railroad transport. Also a different type of motive power. « In addition to modern heavy locomotives which will still be the back-bone of the motive power, there will be light fast locomotives to speed merchandise to its destination. These will embody Super-Power Principles and be very economical to operate and maintain. « They are needed to create the superior service that, alone, can win back lost traffic.



LIMA LOCOMOTIVE WORKS, INCORPORATED

LIMA, OHIO

Revenues and Expenses of Railways

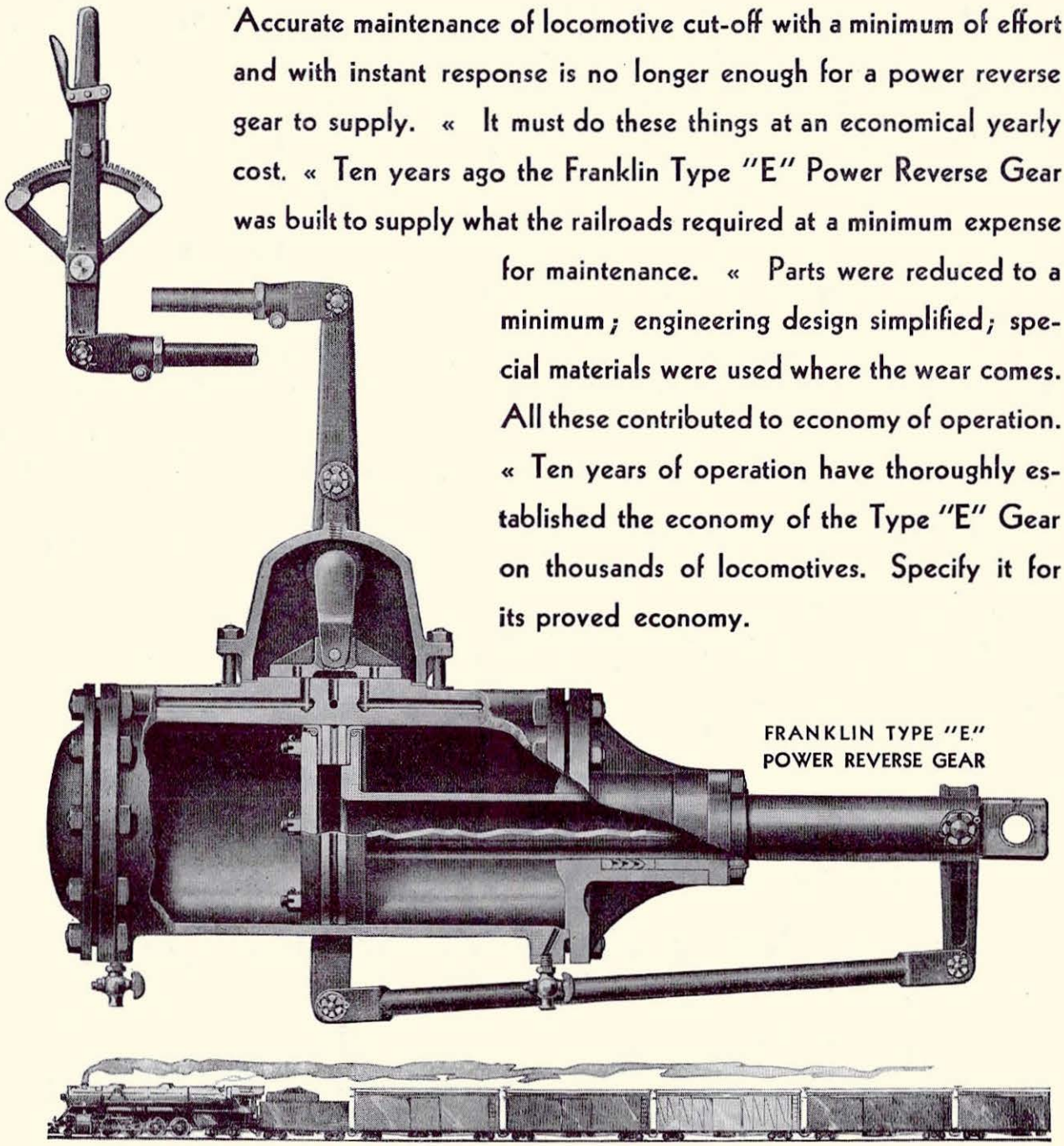
MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Maintenance of—Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
Akron, Canton & Youngstown	Nov.	171	$107,337	$33	$114,041	$12,373	$14,484	$9,491	$39,811	$11,534	$85,120	74.6	$28,921	$17,430	$6,913	$5,809
	11 mos.	171	1,374,489	584	1,447,849	178,080	160,501	109,433	443,257	117,957	998,840	69.0	449,009	318,417	210,056	256,002
Alton	Nov.	978	761,882	145,071	1,045,460	74,561	121,162	56,828	441,397	42,049	749,528	71.7	295,932	188,117	19,203	—70,797
	11 mos.	1,003	9,708,360	1,873,598	13,059,954	1,501,529	1,608,229	680,166	5,353,195	528,515	9,825,854	75.2	3,234,100	2,032,881	451,333	410,007
Alton & Southern	Nov.	31	.....	.....	74,064	13,269	4,839	5,249	25,498	5,433	54,288	73.30	19,776	14,938	12,685	8,329
	11 mos.	31	.....	.....	827,462	75,963	65,899	57,367	287,736	53,254	540,219	65.29	287,243	240,491	211,687	209,863
Atchison, Topeka & Santa Fe	Nov.	9,725	7,643,464	806,970	9,213,113	1,055,904	2,001,973	347,525	2,692,836	376,765	6,468,239	70.2	2,744,874	1,891,457	2,187,726	3,044,406
	11 mos.	9,724	80,730,114	12,519,384	101,982,149	11,578,579	24,391,043	3,729,802	33,364,036	4,284,014	77,270,534	75.8	24,711,615	14,015,766	15,301,312	26,962,788
Gulf, Colorado & Santa Fe	Nov.	1,955	1,514,632	45,366	1,633,856	114,018	262,007	50,305	426,454	63,030	915,286	56.0	718,570	673,983	596,847	284,087
	11 mos.	1,955	12,000,121	552,229	13,347,780	1,555,147	2,944,362	570,602	4,619,736	783,353	10,462,587	78.4	2,885,193	1,912,886	939,951	1,739,027
Panhandle & Santa Fe	Nov.	1,878	751,225	28,848	833,349	95,808	165,134	18,374	242,312	30,276	547,432	65.7	285,917	272,269	198,176	314,090
	11 mos.	1,878	6,874,652	351,305	7,782,460	1,332,374	1,787,633	214,555	2,473,867	358,459	6,154,304	79.1	1,628,156	1,095,202	194,260	1,802,499
Atlanta & West Point	Nov.	93	62,984	13,794	93,185	19,386	23,485	7,351	49,992	7,353	109,636	117.7	—16,451	—26,641	—40,070	—23,983
	11 mos.	93	784,844	204,064	1,174,222	199,688	255,415	88,581	567,220	95,430	1,237,089	105.3	—62,867	—175,276	—305,036	—98,182
Western of Alabama	Nov.	133	65,869	15,578	92,076	18,013	28,597	7,322	43,485	8,146	107,249	116.5	—15,173	—25,748	—20,642	—12,801
	11 mos.	133	790,753	217,084	1,143,194	209,501	318,031	89,164	518,253	93,648	1,254,830	109.8	—111,636	—228,124	—174,880	34,502
Atlanta, Birmingham & Coast	Nov.	639	155,403	4,022	185,113	44,883	56,420	20,275	88,409	15,062	233,420	126.1	—48,307	—60,484	—67,948	—94,096
	11 mos.	639	1,873,396	62,623	2,221,262	542,288	654,348	238,978	1,056,483	186,112	2,775,145	124.9	—553,883	—709,268	—810,785	—870,344
Atlantic Coast Line	Nov.	5,144	2,139,453	211,765	2,631,311	429,844	613,042	115,907	1,081,122	128,552	2,383,386	90.6	247,925	71,211	76,504	134,615
	11 mos.	5,144	26,139,737	4,265,629	33,986,413	5,442,136	7,573,191	1,367,782	13,593,444	1,537,130	29,780,460	87.6	4,205,953	372,059	—437,833	4,226,363
Charleston & Western Carolina	Nov.	342	119,678	1,031	124,272	19,778	20,928	5,449	48,293	5,326	99,774	80.3	24,498	14,058	16,355	7,064
	11 mos.	342	1,447,849	15,999	1,510,102	240,027	260,483	68,053	576,821	57,941	1,203,259	79.7	306,843	136,333	148,400	363,935
Baltimore & Ohio	Nov.	6,397	8,408,208	625,674	9,744,717	758,827	1,658,439	345,650	3,651,181	544,844	7,045,054	72.3	2,699,663	1,955,790	1,602,913	1,921,979
	11 mos.	6,397	97,751,852	9,577,330	116,019,088	9,659,433	20,398,652	4,428,528	42,639,554	6,609,974	84,611,712	72.9	31,407,376	23,207,627	20,131,811	26,939,070
Baltimore & Ohio Chic. Term	Nov	85	.....	.....	264,162	15,840	36,382	1,644	132,770	14,610	206,593	78.2	57,569	18,577	102,544	52,249
	11 mos.	85	.....	.....	2,972,061	259,759	401,985	19,890	1,574,413	178,185	2,490,996	83.8	481,065	60,430	992,268	761,384
Staten Island Rapid Transit	Nov.	23	49,445	82,546	139,438	3,054	13,371	1,656	77,253	13,752	109,086	78.2	30,352	12,352	—622	6,860
	11 mos.	23	507,724	1,063,028	1,654,779	85,516	142,894	20,699	884,504	150,931	1,284,544	77.6	370,235	169,310	—98	159,543
Bangor & Aroostook	Nov.	619	393,587	10,501	420,152	43,008	78,278	4,264	108,644	33,144	267,987	63.8	152,165	113,273	107,895	110,361
	11 mos.	619	5,003,998	204,909	5,443,760	943,811	1,008,280	49,866	1,329,158	281,812	3,623,904	66.6	1,819,856	1,358,363	1,347,117	1,282,859
Belt Ry. Co. of Chicago	Nov.	53	.....	.....	329,828	19,418	34,719	2,724	163,573	12,142	232,576	70.5	97,252	71,250	145,925	49,039
	11 mos.	53	.....	.....	3,643,837	244,489	358,176	32,456	1,795,275	106,984	2,537,380	69.6	1,106,457	660,645	1,226,497	1,150,312
Bessemer & Lake Erie	Nov.	225	378,352	862	385,661	44,419	228,652	12,216	105,536	35,645	426,425	110.6	—40,764	—63,426	—57,139	717,902
	11 mos.	226	3,431,892	13,877	3,516,932	598,547	1,840,204	125,949	1,198,239	435,860	4,198,381	119.4	—681,449	—929,613	—907,255	2,452,949
Boston & Maine	Nov.	2,091	2,372,329	540,924	3,432,608	425,250	601,625	63,328	1,366,461	168,040	2,634,064	76.7	798,544	575,211	419,890	449,442
	11 mos.	2,092	27,505,930	7,474,450	41,562,493	5,408,484	6,387,288	786,250	15,867,505	2,013,315	30,589,756	73.6	10,972,737	8,362,833	6,605,434	9,162,532
Brooklyn Eastern Dist. Term	Nov.	11	59,458	.....	60,430	4,027	12,107	282	21,593	5,761	43,770	72.4	16,660	10,049	10,049	18,391
	11 mos.	11	783,717	.....	792,400	49,133	104,613	2,414	248,804	65,988	470,952	59.4	321,448	247,797	247,797	385,328
Burlington-Rock Island	Nov.	280	131,038	1,584	137,780	11,188	8,481	3,438	47,777	7,371	78,255	56.8	59,525	58,911	35,619	170
	11 mos.	304	874,384	15,382	943,525	171,834	109,883	45,193	417,557	91,148	834,771	88.5	108,754	44,191	—96,456	—112,130
Cambria & Indiana	Nov.	37	108,538	.....	108,738	5,935	33,968	338	12,404	7,161	59,806	55.0	48,932	30,523	91,808	70,529
	11 mos.	37	1,004,710	.....	1,007,166	85,860	403,045	4,458	125,763	91,403	710,529	70.55	296,637	151,394	739,047	842,501
Canadian Pac. Lines in Maine	Nov.	233	45,581	11,415	68,072	22,422	10,973	1,423	56,734	3,440	94,992	139.4	—26,920	—28,570	—45,275	—18,846
	11 mos.	233	1,182,867	183,694	1,491,355	520,171	280,608	49,952	670,009	42,980	1,563,720	104.8	—72,365	—165,315	—373,865	—454,594
Canadian Pac. Lines in Vermont	Nov.	85	34,105	8,153	56,245	16,724	7,321	661	51,816	2,622	79,144	140.7	—22,899	—29,899	—50,922	—37,195
	11 mos.	85	618,454	157,607	976,179	206,850	215,882	22,430	615,194	31,587	1,091,943	111.8	—115,764	—174,444	—405,686	—425,285
Central of Georgia	Nov.	1,944	755,516	63,874	911,562	100,437	188,290	48,604	393,000	67,387	799,915	87.8	111,647	8,569	—7,997	15,340
	11 mos.	1,944	8,501,823	1,013,401	10,733,542	1,323,542	2,102,749	593,475	4,755,111	778,266	9,611,387	89.5	1,122,155	—7,565	—203,246	1,674,803
Central New Jersey	Nov.	691	1,786,433	341,905	2,302,554	101,799	379,022	41,983	897,896	92,512	1,526,713	66.3	775,841	353,162	267,879	251,453
	11 mos.	692	20,980,795	4,985,001	27,895,582	2,190,092	5,141,719	564,164	11,223,527	1,043,147	20,330,004	72.9	7,565,578	3,096,205	2,373,783	3,766,315
Central Vermont	Nov.	457	307,332	22,001	378,135	62,245	68,625	13,233	195,655	19,205	359,147	95.0	18,988	2,054	—10,561	33,203
	11 mos.	457	3,829,645	489,777	4,860,231	903,143	903,052	172,040	2,198,267	227,111	4,406,189	90.7	454,042	262,135	148,329	643,815
Chesapeake & Ohio	Nov.	3,144	8,205,474	174,348	8,753,213	1,095,699	1,417,242	149,372	2,050,816	284,101	5,009,861	57.2	3,743,352	2,955,706	2,872,375	2,338,786
	11 mos.	3,144	84,513,815	2,474,132	90,615,520	9,844,922	15,156,280	1,731,128	21,195,781	3,269,759	51,374,520	56.7	39,241,000	30,566,252	29,727,507	33,635,490
Chicago & Eastern Illinois	Nov.	938	820,654	79,540	988,334	136,838	155,253	56,245	429,651	56,497	839,249	84.9	149,085	58,848	—66,876	—201,982
	11 mos.	938	9,011,485	1,074,467	11,168,978	1,462,266	1,976,818	652,184	4,976,719	639,847	9,785,357	87.6	1,383,621	189,202	—1,218,376	—1,542,637

Continued on next left-hand page

ACCURATE CUT-OFF CONTROL

. . . at an economical cost!



Accurate maintenance of locomotive cut-off with a minimum of effort and with instant response is no longer enough for a power reverse gear to supply. « It must do these things at an economical yearly cost. « Ten years ago the Franklin Type "E" Power Reverse Gear was built to supply what the railroads required at a minimum expense for maintenance. « Parts were reduced to a minimum; engineering design simplified; special materials were used where the wear comes. All these contributed to economy of operation. « Ten years of operation have thoroughly established the economy of the Type "E" Gear on thousands of locomotives. Specify it for its proved economy.

FRANKLIN TYPE "E" POWER REVERSE GEAR

FRANKLIN RAILWAY SUPPLY COMPANY, Inc.

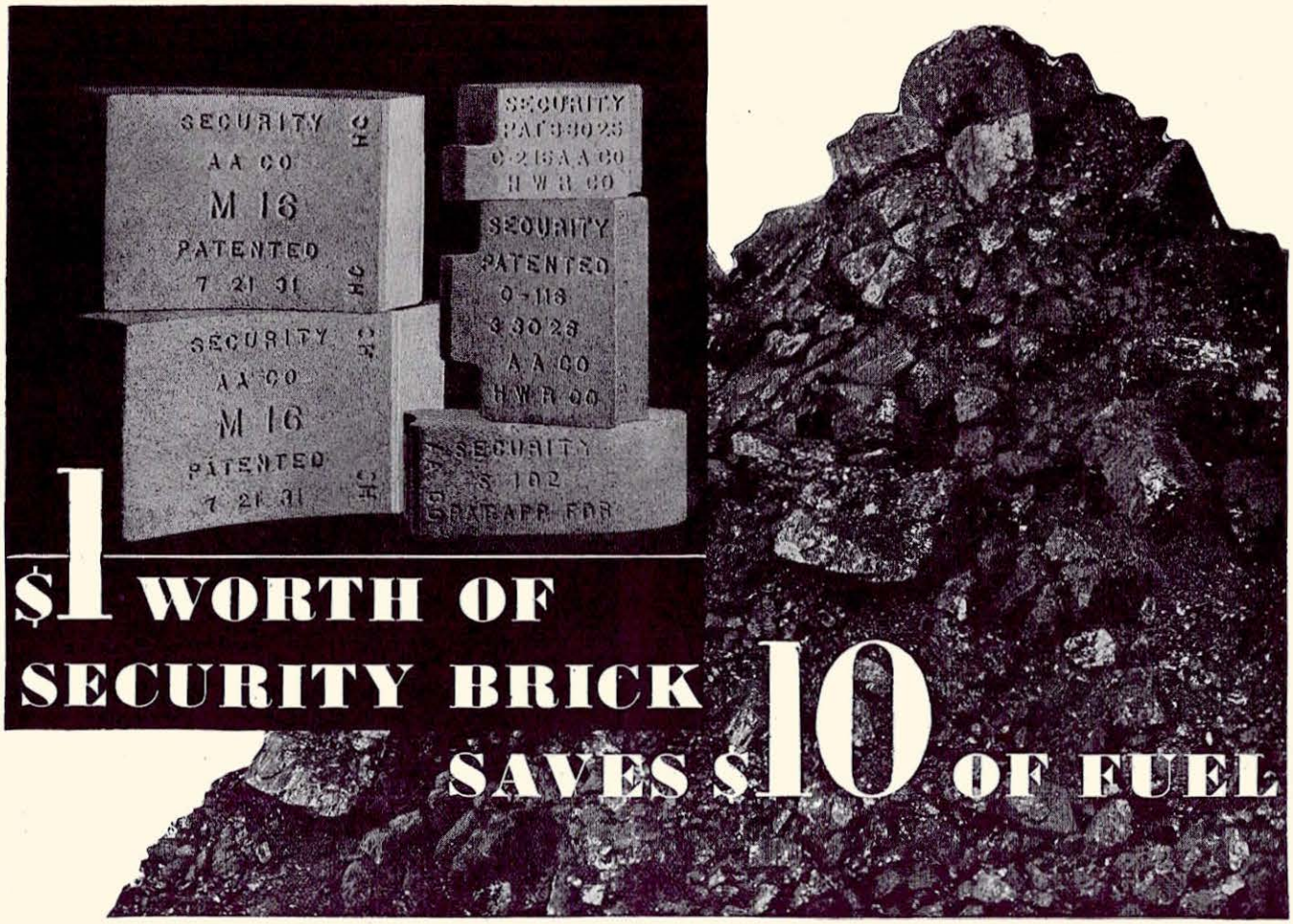
NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Maintenance of—Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
Chicago & Illinois Midland	Nov.	131	$212,573	$1,233	$220,414	$23,810	$37,811	$18,212	$58,971	$14,528	$153,332	69.6	$67,082	$58,528	$59,312	$53,161
	11 mos.	131	1,728,380	15,631	1,820,035	175,756	393,160	196,203	562,769	175,104	1,501,993	82.5	318,042	224,724	165,331	422,359
Chicago & North Western	Nov.	8,442	4,094,872	652,239	5,443,007	712,692	1,167,594	149,884	2,336,815	273,798	4,671,190	85.8	771,817	183,830	—160,539	—665,481
	11 mos.	8,442	50,024,039	9,212,540	67,099,126	9,644,300	12,911,586	1,807,281	28,276,465	3,125,196	56,165,758	83.7	10,933,368	3,897,186	1,048,255	6,064,192
Chicago, Burlington & Quincy	Nov.	9,248	5,176,739	463,242	6,357,412	774,041	1,079,907	190,280	2,317,897	284,096	4,677,954	73.6	1,679,458	985,203	646,596	1,309,309
	11 mos.	9,263	58,608,938	6,738,355	73,587,851	8,955,375	12,294,257	2,345,322	26,562,538	3,234,793	53,925,225	73.3	19,662,626	12,094,074	8,950,722	19,780,000
Chicago Great Western	Nov.	1,499	1,050,933	40,179	1,178,303	236,053	154,507	55,808	475,631	55,732	976,537	82.9	201,766	142,882	—85,062	171,443
	11 mos.	1,491	12,414,037	639,868	14,020,341	2,156,463	1,795,851	662,292	5,445,107	606,565	10,687,929	76.2	3,332,412	2,549,038	439,792	2,395,708
Chicago, Indianapolis & Louisville	Nov.	644	503,241	46,822	616,901	32,945	139,752	24,893	266,936	22,899	491,068	79.6	125,833	119,936	35,299	—77,525
	11 mos.	644	5,859,257	588,936	7,301,553	690,298	1,575,784	286,499	3,132,436	288,788	6,036,765	82.7	1,264,788	790,988	—212,782	173,413
Chicago, Mil., St. Paul & Pacific	Nov.	11,242	5,629,302	405,679	6,735,772	820,962	1,520,914	241,622	2,683,283	277,080	5,570,265	82.7	1,165,507	576,912	129,884	384,673
	11 mos.	11,264	65,004,139	5,445,493	78,319,320	12,929,962	17,194,339	2,596,582	30,802,671	3,195,308	66,823,076	85.3	11,496,244	4,151,091	—805,591	7,740,175
Chicago River & Indiana	Nov.	20	.....	.....	347,429	16,500	19,000	1,419	110,622	12,613	160,154	46.1	187,275	167,042	224,428	244,786
	11 mos.	20	.....	.....	3,977,696	203,000	263,000	16,074	1,295,367	138,754	1,916,195	48.2	2,061,501	1,734,637	2,357,831	2,634,309
Chicago, Rock Island & Pacific	Nov.	7,611	3,811,235	460,338	4,807,536	522,159	1,119,013	186,765	2,174,581	275,186	4,333,952	90.1	473,584	72,127	—193,374	64,849
	11 mos.	7,619	49,575,333	6,020,751	61,901,466	5,839,212	12,374,348	2,162,310	25,199,448	3,098,470	49,429,441	79.9	12,472,025	7,056,687	3,403,318	11,390,362
Chicago, Rock Island & Gulf	Nov.	721	333,898	21,746	317,055	39,500	32,901	16,606	111,817	17,999	221,286	69.8	95,769	79,303	28,409	118,446
	11 mos.	721	3,502,901	263,862	3,737,658	408,539	370,536	188,918	1,298,953	208,128	2,506,963	67.1	1,230,695	984,483	424,954	1,698,658
Chic., St. Paul, Minn. & Omaha	Nov.	1,736	927,704	96,708	1,124,229	140,000	195,668	32,014	538,805	63,052	977,057	86.9	147,172	74,729	9,737	—45,147
	11 mos.	1,736	10,970,846	1,519,420	13,715,762	2,283,579	2,490,128	365,535	6,308,982	701,049	12,219,133	89.1	1,496,629	598,326	—178,886	228,589
Clinchfield R. R.	Nov.	309	351,826	1,601	358,355	31,138	88,641	14,538	69,510	12,817	216,644	60.5	141,711	86,711	109,185	132,485
	11 mos.	309	3,587,388	24,303	3,665,245	438,617	959,768	174,509	764,562	152,610	2,489,737	67.9	1,175,508	490,048	663,355	1,381,864
Colorado & Southern	Nov.	1,030	425,355	21,046	496,587	55,146	86,635	11,351	153,826	31,828	337,088	67.9	159,499	114,631	97,470	173,783
	11 mos.	1,031	4,202,218	310,819	5,055,864	759,292	1,201,407	140,806	1,905,918	357,565	4,289,711	84.8	766,153	101,126	—74,686	618,963
Ft. Worth & Denver City	Nov.	804	547,680	31,758	684,160	54,121	75,908	15,487	152,343	32,728	329,535	48.2	354,625	341,739	311,170	244,489
	11 mos.	744	4,293,838	436,713	5,483,689	549,245	828,833	183,706	1,665,828	366,811	3,366,621	61.4	2,117,068	1,797,876	1,470,112	2,102,402
Columbus & Greenville	Nov.	167	60,621	3,577	69,053	17,394	9,225	2,636	26,195	9,825	64,789	93.8	4,264	2,313	4,097	11,732
	11 mos.	167	588,312	51,317	685,967	200,295	120,327	34,211	275,973	112,923	742,538	108.2	—56,571	—72,433	—52,285	85,851
Conemaugh & Black Lick	Nov.	20	10,372	.....	23,691	6,227	6,352	286	13,018	3,264	29,147	123.0	—5,456	—5,456	—4,237	14,912
	11 mos.	20	123,606	.....	293,654	48,684	81,003	3,923	186,587	39,307	359,504	122.4	—65,850	—69,350	—56,799	9,299
Delaware & Hudson	Nov.	854	1,612,051	77,336	1,801,299	291,169	530,797	46,849	787,043	132,653	1,792,862	99.5	8,437	—58,096	—43,319	534,447
	11 mos.	854	18,447,606	1,305,887	21,343,595	3,341,298	5,936,473	561,728	8,950,445	1,565,725	20,406,918	95.6	936,677	7,084	—15,395	4,119,038
Delaware, Lackawanna & Western	Nov.	998	2,663,790	537,213	3,709,924	280,726	758,311	111,945	1,623,973	151,857	2,929,188	79.0	780,736	280,488	277,894	351,470
	11 mos.	998	29,848,886	6,789,092	42,777,440	4,090,468	8,286,089	1,322,895	18,415,022	1,704,864	34,109,316	79.7	8,668,124	3,724,736	3,576,849	6,698,340
Denver & Rio Grande Western	Nov.	2,513	1,465,581	52,575	1,612,739	78,465	253,814	43,600	479,335	72,905	933,002	57.9	679,737	528,938	443,082	463,283
	11 mos.	2,533	14,104,501	971,129	16,153,097	1,786,220	3,371,540	512,111	5,215,080	851,702	11,827,906	73.2	4,325,191	2,565,643	2,439,210	4,800,901
Denver & Salt Lake	Nov.	232	150,407	3,567	165,411	12,881	20,324	1,518	25,788	9,272	69,766	42.2	95,645	85,642	87,487	140,731
	11 mos.	232	1,525,268	59,107	1,710,513	239,087	270,906	18,743	291,292	109,382	910,384	53.2	800,129	637,035	675,131	796,856
Detroit & Mackinac	Nov.	242	55,213	1,566	62,258	9,046	12,773	1,067	23,622	4,692	51,184	82.2	11,074	5,273	6,305	11,365
	11 mos.	242	607,977	31,919	717,817	130,562	115,285	13,953	261,689	45,495	566,802	79.0	151,015	106,498	107,769	200,901
Detroit & Toledo Shore Line	Nov.	50	217,485	.....	219,525	13,127	18,501	6,058	53,648	6,332	97,585	44.5	121,940	99,204	61,521	31,651
	11 mos.	50	2,027,305	.....	2,046,513	187,965	238,185	78,746	554,480	73,128	1,131,831	55.3	914,682	705,585	294,101	394,585
Detroit Terminal	Nov.	19	.....	.....	42,309	4,394	7,517	.....	17,708	2,460	32,079	75.8	10,230	—1,421	2,194	—23,795
	11 mos.	19	.....	.....	549,478	62,605	83,450	49	304,217	32,114	482,435	87.8	67,043	—64,186	—102,113	—81,690
Detroit, Toledo & Ironton	Nov.	483	271,979	240	281,012	23,958	54,046	10,181	97,071	17,639	202,177	71.9	78,835	34,679	24,010	500
	11 mos.	487	3,705,451	4,309	3,814,653	476,766	733,514	121,808	1,290,603	228,876	2,842,711	74.5	971,942	492,386	417,681	929,342
Duluth, Missabe & Northern	Nov.	563	53,536	1,171	67,267	72,988	144,549	2,408	113,975	39,433	373,352	555.0	—306,085	—311,457	—311,287	702,235
	11 mos.	563	1,966,261	17,696	2,310,155	955,679	1,560,611	34,091	1,389,764	444,217	4,384,162	189.8	—2,074,007	—2,192,712	—2,191,009	3,087,791
Duluth, Winnipeg & Pacific	Nov.	178	55,711	2,197	63,229	15,492	22,711	2,642	36,298	5,895	82,931	131.2	—19,702	—22,897	—3,174	—23,014
	11 mos.	178	699,358	37,479	786,749	239,342	221,570	33,317	418,994	60,986	980,589	124.6	—193,840	—234,779	—43,707	—322,579
Elgin, Joliet & Eastern	Nov.	447	523,295	.....	561,602	50,940	156,766	11,426	258,626	62,230	539,993	96.1	21,609	—33,821	—54,316	17,308
	11 mos.	447	6,622,929	24	7,175,644	915,919	1,712,335	139,355	3,253,379	603,737	6,624,464	92.3	551,180	—590,239	—957,101	141,134
Erie Railroad	Nov.	2,046	4,149,171	429,356	4,996,000	487,481	1,072,724	125,607	1,938,153	239,914	3,880,637	77.7	1,115,363	784,226	630,968	256,040
	11 mos.	2,046	48,775,742	5,487,381	59,644,582	6,661,565	12,446,033	1,554,664	22,263,578	2,741,508	45,893,512	76.9	13,751,070	9,498,341	7,873,155	9,380,699
Chicago & Erie	Nov.	269	591,140	16,318	648,420	88,123	117,862	21,990	209,405	33,128	470,064	72.5	178,356	229,091	11,446	63,900
	11 mos.	269	7,379,034	245,260	8,193,027	1,110,604	1,235,317	264,871	2,328,260	374,922	5,310,443	64.8	2,882,584	2,416,309	114,992	473,953

Continued on next left-hand page



anything less than a complete arch is false economy

To let the desire for reduced inventory result in a locomotive leaving any roundhouse without a full set of Arch Brick is poor economy.

Even a single missing Arch Brick will soon waste many times its cost in fuel and in locomotive efficiency.

To spend the fuel dollar efficiently, every locomotive Arch must be maintained 100%.

Be sure your stocks on hand are ample to provide fully for all locomotive requirements, so that locomotive efficiency may be maintained.

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists › › ›

Revenues and Expenses of Railways

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

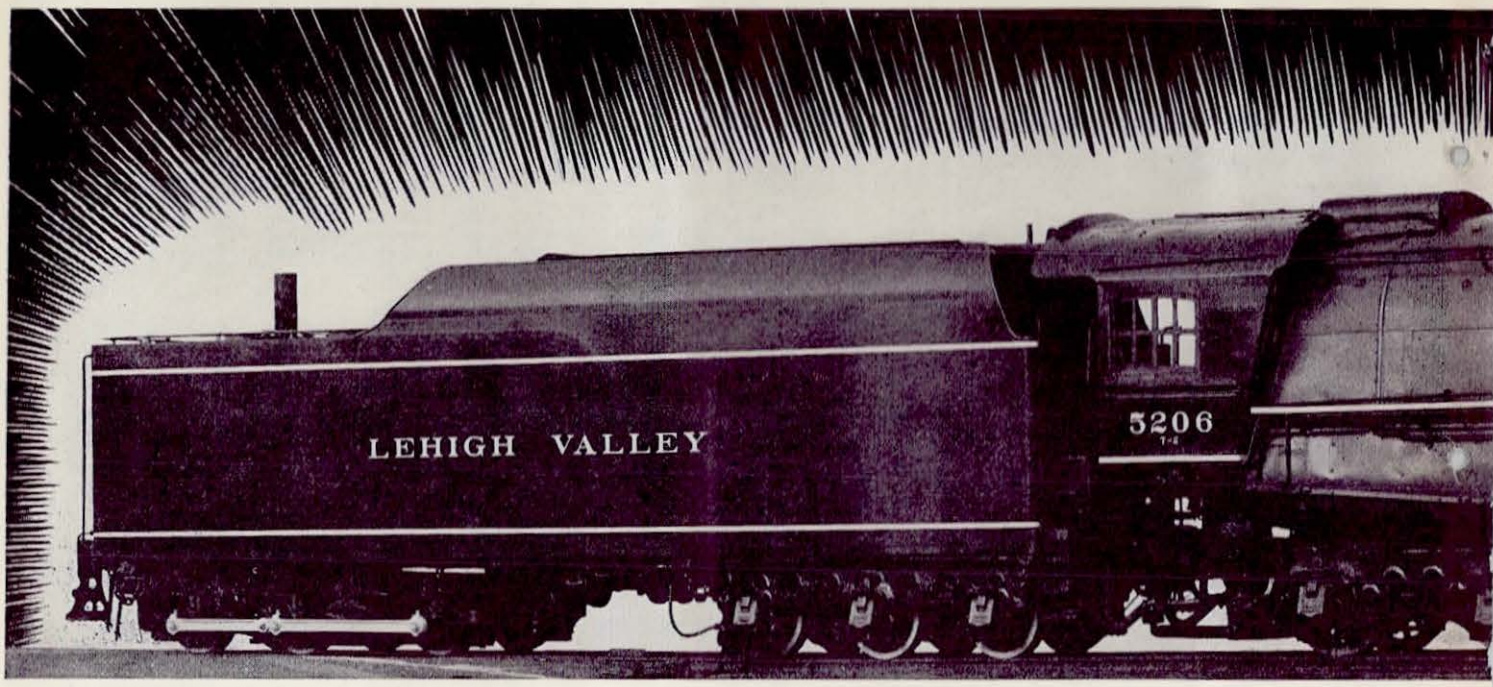
Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
New Jersey & New York	Nov.	45	$17,985	$69,317	$89,327	$7,683	$22,411	$1,310	$50,263	$3,176	$84,843	95.0	$4,484	—$516	—$20,543	—$36,388
	11 mos.	45	188,677	793,633	1,011,407	103,903	266,157	16,327	539,567	37,111	963,084	95.2	48,323	—7,858	—223,527	—184,236
N. Y. Susquehanna & Western	Nov.	131	223,593	27,038	267,456	26,547	51,249	3,964	108,234	10,191	199,921	74.7	67,535	49,526	35,015	—15,022
	11 mos.	131	2,664,986	329,493	3,198,429	341,877	555,209	49,973	1,237,771	119,173	2,303,419	72.0	895,010	554,489	391,450	459,123
Florida East Coast	Nov.	839	314,406	60,713	456,251	116,191	131,260	22,261	139,988	38,300	448,506	98.3	7,745	7,555	—14,667	—13,841
	11 mos.	860	3,868,240	1,440,652	6,137,143	1,192,541	1,468,047	235,919	1,820,875	442,092	5,224,727	85.1	912,416	37,079	—373,762	414,035
Fort Smith & Western	Nov.	249	65,383	1,016	70,312	15,388	12,402	5,114	22,713	5,156	60,722	86.4	9,590	7,190	4,402	1,146
	11 mos.	249	578,874	12,493	634,907	151,721	113,489	52,387	238,296	52,752	609,180	95.9	25,727	—3,906	—55,713	—110,436
Galveston Wharf	Nov.	11	.....	.....	121,707	3,338	3,456	2,765	27,195	5,440	47,450	39.0	74,257	43,574	43,580	87,950
	11 mos.	11	.....	.....	1,504,014	433,160	47,672	38,258	255,502	67,442	968,192	64.4	535,822	274,543	274,448	437,742
Georgia R. R.	Nov.	329	202,733	11,242	231,219	35,308	52,478	16,766	113,562	13,794	232,302	100.5	—1,083	—6,529	7,725	21,161
	11 mos.	329	2,260,313	176,800	2,648,764	366,551	503,332	199,613	1,239,519	171,574	2,471,232	93.3	177,532	103,810	237,676	549,223
Georgia & Florida	Nov.	463	49,586	942	55,142	17,093	15,936	8,091	29,396	6,339	76,978	139.6	—21,836	—21,836	—21,948	—14,285
	11 mos.	463	695,243	17,456	764,623	200,242	172,048	93,850	352,187	70,880	890,936	116.5	—126,313	—193,379	—203,066	—67,037
Grand Trunk Western	Nov.	1,023	907,788	48,895	1,040,462	150,460	251,829	39,812	530,835	81,832	1,056,685	101.6	—16,223	—98,615	—214,597	—299,598
	11 mos.	1,022	11,044,443	722,797	12,801,670	1,905,879	2,864,366	501,416	6,448,129	967,770	12,745,827	99.6	55,843	—977,592	—1,990,991	—1,673,993
Canadian Nat'l Lines in New Eng.	Nov.	172	75,701	8,103	94,728	23,099	18,927	3,048	60,906	9,582	117,785	124.3	—23,057	—37,187	—70,855	—80,350
	11 mos.	172	856,685	94,437	1,094,257	251,373	225,265	39,085	672,710	99,606	1,314,129	120.0	—219,872	—364,518	—833,940	—1,007,096
Great Northern	Nov.	8,457	4,160,858	260,341	4,847,706	452,055	909,192	153,599	1,675,253	187,756	3,418,706	70.5	1,429,000	889,788	766,838	1,298,104
	11 mos.	8,404	42,805,175	3,596,687	51,493,471	7,370,958	11,504,774	1,962,992	18,971,918	2,115,719	42,293,960	82.1	9,199,511	2,691,484	867,898	11,772,598
Green Bay & Western	Nov.	234	96,063	743	99,659	15,619	12,674	4,117	31,428	2,506	66,332	66.6	33,327	29,827	28,065	25,704
	11 mos.	234	1,021,649	14,518	1,068,572	225,406	167,506	49,439	449,792	28,907	920,332	86.1	148,240	82,737	59,159	145,934
Gulf & Ship Island	Nov.	307	63,053	6,859	77,801	10,951	16,385	2,454	44,585	4,770	79,141	101.7	—1,340	—19,247	—28,748	28,642
	11 mos.	307	721,564	103,755	956,299	114,318	157,831	33,791	540,351	65,538	914,588	95.6	41,711	—149,466	—255,616	—396,816
Gulf, Mobile & Northern	Nov.	733	232,966	8,102	257,475	28,956	58,578	21,652	95,420	15,666	220,272	85.55	37,203	23,191	2,522	28,679
	11 mos.	733	2,631,664	106,280	2,920,921	439,294	613,541	246,763	1,073,514	193,961	2,567,073	87.89	353,848	108,288	—107,327	133,529
Illinois Central	Nov.	5,014	5,078,149	550,694	6,093,474	483,616	1,290,087	141,274	2,349,371	304,126	4,597,881	75.5	1,495,593	1,043,421	939,657	1,127,058
	11 mos.	5,016	57,785,262	7,563,911	71,417,857	6,214,219	14,428,828	2,054,606	26,702,734	3,466,615	53,269,511	74.6	18,148,346	12,458,656	11,111,872	10,074,002
Yazoo & Mississippi Valley	Nov.	1,673	882,087	72,040	1,030,563	35,754	137,643	24,456	423,308	48,713	670,661	65.1	359,902	222,075	124,521	627,603
	11 mos.	1,675	9,130,826	861,569	10,809,918	984,937	1,508,396	337,269	4,653,178	585,792	8,094,667	74.9	2,715,251	1,225,055	231,108	242,837
Illinois Central System	Nov.	6,687	5,960,236	622,734	7,124,037	519,370	1,427,730	165,730	2,772,679	352,839	5,268,542	74.0	1,855,495	1,265,496	1,064,178	1,754,661
	11 mos.	6,691	66,916,088	8,425,480	82,227,775	7,199,156	15,937,224	2,391,875	31,355,912	4,052,407	61,364,178	74.6	20,863,597	13,683,711	11,342,980	10,316,839
Illinois Terminal	Nov.	542	302,036	53,214	370,850	41,783	52,149	15,624	150,651	21,944	281,972	76.03	88,878	66,739	39,696	89,793
	11 mos.	543	3,368,978	612,548	4,181,011	542,999	547,621	173,022	1,583,985	246,724	3,083,458	73.75	1,097,553	841,500	543,560	1,311,988
Kansas City Southern	Nov.	783	566,504	16,746	670,868	67,328	136,393	39,588	223,636	61,398	529,755	79.0	141,113	92,706	77,017	109,334
	11 mos.	783	6,746,481	268,480	8,097,723	803,746	1,404,531	482,341	2,646,368	695,848	6,057,319	74.8	2,040,404	1,128,809	892,220	2,256,593
Texarkana & Ft. Smith	Nov.	99	67,814	1,109	87,484	11,547	8,072	5,234	27,548	7,654	61,158	69.9	26,326	26,259	9,509	697
	11 mos.	99	888,960	17,438	1,051,222	134,882	91,088	66,305	321,923	95,727	726,070	68.5	325,152	236,347	26,758	360,367
Kansas, Oklahoma & Gulf	Nov.	326	144,338	352	147,412	13,916	15,090	7,745	35,733	6,306	78,669	53.4	68,743	59,834	46,267	42,210
	11 mos.	326	1,609,805	4,529	1,644,876	189,660	177,608	98,651	410,377	83,221	957,719	58.2	687,157	539,348	383,308	611,011
Lake Superior & Ishpeming	Nov.	160	33,501	134	36,435	14,393	7,641	520	16,466	4,883	43,903	120.5	—7,468	—17,317	—18,865	—373
	11 mos.	160	376,754	978	418,110	181,358	129,441	6,029	182,623	58,623	558,074	133.5	—139,964	—291,598	—304,036	87,276
Lake Terminal	Nov.	12	.....	.....	25,996	3,099	3,542	.....	14,189	2,953	23,783	91.5	2,213	—723	—682	14,936
	11 mos.	12	.....	.....	331,418	28,992	43,112	.....	156,591	23,063	251,758	76.0	79,660	49,199	65,458	86,709
Lehigh & Hudson River	Nov.	96	121,886	243	129,011	9,816	19,659	2,834	50,485	6,314	89,108	69.1	39,903	27,729	14,969	13,447
	11 mos.	96	1,354,549	5,071	1,448,149	177,559	225,261	34,891	512,564	86,267	1,036,500	71.6	411,649	272,617	128,671	216,281
Lehigh & New England	Nov.	228	266,390	420	269,667	31,153	54,121	4,521	88,895	19,762	198,448	73.6	71,219	60,904	68,775	53,089
	11 mos.	217	2,979,238	5,358	3,015,291	377,534	630,174	52,430	1,028,297	195,426	2,283,811	75.7	731,480	615,302	710,891	782,335
Lehigh Valley	Nov.	1,362	2,643,244	181,930	3,073,091	203,407	695,870	108,685	1,351,052	124,902	2,497,647	81.3	575,444	452,831	341,160	5,217
	11 mos.	1,362	29,654,578	2,574,998	35,399,717	2,967,588	7,903,942	1,294,011	15,382,152	1,383,103	29,100,289	82.2	6,299,428	3,747,192	2,680,523	4,515,911
Louisiana & Arkansas	Nov.	608	292,356	8,153	322,346	53,689	55,374	18,289	84,521	15,805	227,831	70.7	94,515	75,423	67,435	151,142
	11 mos.	608	3,390,032	103,433	3,765,423	577,301	624,751	227,440	995,400	211,706	2,636,325	70.0	1,129,100	736,175	721,864	1,376,509
Louisiana, Arkansas & Texas	Nov.	255	64,905	937	72,840	9,549	6,081	3,764	21,373	3,865	44,632	61.3	28,208	25,312	15,848	—1,843
	11 mos.	224	560,889	5,263	627,963	144,940	74,350	38,805	222,122	47,448	527,071	83.9	100,892	68,216	—11,246	—84,496
Louisville & Nashville	Nov.	5,177	4,700,095	338,203	5,419,592	592,878	1,010,468	151,760	1,801,886	267,092	3,853,508	71.1	1,566,084	1,216,272	1,285,706	539,131
	11 mos.	5,247	48,977,783	4,739,831	58,437,757	8,336,969	12,428,654	1,892,419	21,901,277	3,150,016	48,026,750	82.2	10,411,007	5,858,976	6,284,462	8,736,165

Revenues and Expenses of Railways

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
Maine Central	Nov.	1,121	$672,398	$69,348	$816,347	$95,644	$144,166	$12,170	$333,038	$35,957	$620,891	76.1	$195,456	$146,547	$125,018	$29,393
	11 mos.	1,121	8,184,004	1,126,841	10,395,637	1,602,826	1,717,508	167,524	4,085,959	446,525	8,024,251	77.2	2,371,386	1,758,038	1,403,707	1,781,554
Midland Valley	Nov.	363	131,164	486	135,287	14,067	9,769	2,640	30,825	6,395	63,627	47.0	71,660	63,521	51,681	37,959
	11 mos.	363	1,353,155	7,910	1,402,443	203,763	149,244	38,607	342,740	81,481	810,553	57.8	591,890	479,827	397,854	481,292
Minneapolis & St. Louis	Nov.	1,627	568,060	14,622	624,316	88,911	124,960	29,362	292,095	36,898	571,548	91.5	52,768	14,301	—14,112	—12,441
	11 mos.	1,627	6,555,899	226,151	7,259,928	1,121,582	1,469,814	337,810	3,493,896	451,755	6,871,895	94.7	388,033	—94,720	—360,029	123,533
Minn., St. Paul & S. S. Marie	Nov.	4,349	1,556,805	81,495	1,792,941	280,008	328,028	63,927	777,599	107,558	1,563,295	87.2	229,646	75,671	—62,301	—141,650
	11 mos.	4,349	17,428,011	1,316,988	20,554,117	3,089,927	4,520,899	743,085	8,898,067	1,192,065	18,528,779	90.1	2,025,338	102,923	—1,410,206	429,500
Duluth, South Shore & Atlantic	Nov.	560	34,316	8,381	56,199	19,001	28,905	6,352	65,529	7,171	127,825	227.5	—71,626	—98,616	—102,181	—32,830
	11 mos.	560	1,177,919	145,136	1,490,519	380,610	363,713	72,889	797,554	93,693	1,720,973	115.5	—230,459	—524,814	—563,332	—179,981
Spokane International	Nov.	163	30,834	1,389	36,028	12,555	5,057	2,419	18,965	4,167	42,558	118.1	—6,530	—10,482	—11,252	—7,683
	11 mos.	163	426,109	24,961	496,785	163,773	55,221	30,188	237,412	52,805	543,361	109.4	—46,576	—100,798	—125,360	—1,985
Mississippi Central	Nov.	150	42,812	1,653	46,290	6,549	11,728	6,290	16,185	5,205	45,957	99.3	333	—3,443	—6,516	19,127
	11 mos.	150	534,254	14,922	570,533	82,363	123,611	82,385	197,927	60,121	546,399	95.8	24,134	—17,154	—57,994	131,532
Missouri & North Arkansas	Nov.	364	58,915	976	65,841	14,926	9,921	6,001	27,687	5,796	64,261	97.6	1,580	—1,010	—9,650	174
	11 mos.	364	715,015	14,464	788,716	178,428	116,049	81,248	324,210	78,679	776,893	98.5	11,823	—15,366	—107,301	—91,473
Missouri-Illinois	Nov.	202	68,118	359	70,002	13,488	12,845	2,343	24,054	5,367	58,096	83.0	11,906	6,823	1,623	8,237
	11 mos.	202	784,364	5,311	808,126	143,671	147,996	33,916	270,089	62,149	657,606	81.4	150,520	93,583	20,313	159,443
Missouri-Kansas-Texas Lines	Nov.	3,188	1,944,611	175,146	2,353,528	205,478	244,901	109,266	799,661	131,508	1,504,496	63.9	849,032	699,232	524,258	520,976
	11 mos.	3,188	20,300,867	2,057,191	24,920,110	2,845,486	3,453,996	1,230,269	8,526,720	1,465,253	17,679,700	70.9	7,240,410	5,113,150	3,344,753	4,496,416
Missouri Pacific	Nov.	7,436	5,064,292	294,683	5,831,458	636,970	1,047,695	220,400	2,204,932	268,232	4,390,090	75.3	1,441,368	1,188,786	854,205	862,748
	11 mos.	7,436	54,611,789	4,245,706	64,715,646	7,099,564	11,650,273	2,515,683	24,626,681	3,060,082	49,167,412	76.0	15,548,234	11,849,514	8,259,296	16,188,814
Gulf Coast Lines	Nov.	1,030	467,161	27,521	533,086	59,385	115,897	31,346	162,129	41,729	405,853	76.13	127,233	103,226	73,980	23,739
	11 mos.	1,030	6,516,111	405,802	7,380,208	844,221	1,381,145	385,162	2,069,879	489,648	5,160,386	69.92	2,219,822	1,745,713	1,155,841	1,608,090
International-Great Northern	Nov.	1,159	730,740	52,170	871,021	85,604	141,384	25,482	354,089	45,964	657,325	75.47	213,696	186,339	97,494	35,833
	11 mos.	1,159	7,689,651	707,979	9,360,276	1,166,270	1,658,133	313,015	3,881,396	553,551	7,646,856	81.69	1,713,420	1,296,469	488,896	2,433,834
San Antonio, Uvalde & Gulf	Nov.	316	56,999	3,960	66,589	18,249	6,611	4,284	15,061	4,856	49,058	73.7	17,531	13,819	—8,534	—37,836
	11 mos.	316	753,078	61,806	886,430	219,610	123,534	49,711	228,029	55,819	671,245	75.7	215,185	167,553	—100,724	—84,478
Mobile & Ohio	Nov.	1,239	616,908	17,601	673,162	95,926	129,593	36,423	257,925	40,987	562,657	83.6	110,505	78,602	16,847	—95,630
	11 mos.	1,224	6,582,625	253,479	7,305,664	1,094,772	1,402,131	473,678	3,093,268	440,589	6,521,169	89.3	784,495	173,039	—488,772	—180,287
Monongahela	Nov.	177	301,692	535	303,797	16,965	20,432	943	63,110	7,196	108,646	35.8	195,151	176,049	107,549	115,926
	11 mos.	177	3,324,452	10,003	3,354,730	294,113	294,292	11,189	689,319	82,610	1,371,665	40.9	1,983,065	1,802,279	1,049,307	1,159,731
Monongahela Connecting	Nov.	6	.....	.....	34,655	10,273	15,131	45	22,375	2,551	50,375	145.4	—15,720	—20,869	—20,687	—28,241
	11 mos.	6	.....	.....	435,645	94,242	170,600	926	278,142	28,895	572,805	131.5	—137,160	—191,634	—191,879	—70,212
Montour	Nov.	57	172,810	.....	174,177	10,832	35,745	1,099	34,319	13,874	95,869	55.0	78,308	70,445	86,851	53,181
	11 mos.	57	1,374,745	.....	1,381,963	130,463	374,255	14,386	308,862	81,144	909,098	65.8	472,865	439,343	636,691	870,909
Nashville, Chattanooga & St. Louis	Nov.	1,203	760,676	58,044	910,794	130,969	223,542	50,277	376,738	50,941	834,882	91.7	75,912	48,272	47,792	86,568
	11 mos.	1,203	8,544,048	844,438	10,469,004	1,484,140	2,284,559	626,234	4,333,266	601,618	9,375,366	89.6	1,093,638	634,601	565,637	802,342
Nevada Northern	Nov.	165	18,116	1,311	23,098	11,079	3,307	790	8,090	3,658	26,924	116.5	—3,826	—11,577	—7,547	—2,864
	11 mos.	165	242,032	18,400	310,246	105,741	46,131	8,575	94,539	41,431	296,417	95.5	13,829	—68,530	—25,595	—228,505
Newburgh & South Shore	Nov.	6	.....	.....	54,909	5,468	16,921	.....	25,507	4,501	52,397	95.4	2,512	—529	2,430	31,400
	11 mos.	6	.....	.....	549,919	83,268	188,818	.....	291,363	53,418	616,867	112.2	—66,948	—179,105	—146,868	—49,524
New Orleans Great Northern	Nov.	264	126,211	6,036	136,351	9,824	16,869	10,938	40,066	7,524	85,221	62.5	51,130	49,736	23,861	36,024
	11 mos.	264	1,405,452	87,165	1,542,996	150,775	204,191	135,306	499,945	83,770	1,073,987	69.6	469,009	362,314	111,603	424,828
New Orleans Terminal	Nov.	20	644	.....	137,191	8,024	6,387	.....	25,199	706	40,316	29.4	96,875	85,232	64,337	76,066
	11 mos.	20	10,909	.....	1,340,058	110,239	75,945	.....	334,407	13,408	533,999	39.8	806,059	678,623	478,045	493,281
New York Central	Nov.	11,495	16,006,741	4,056,221	23,025,040	2,283,347	5,857,794	491,420	8,734,289	612,163	18,287,622	79.4	4,737,418	2,952,124	1,665,346	995,540
	11 mos.	11,510	178,005,854	55,053,616	269,954,617	26,811,795	59,020,139	6,278,897	102,071,243	11,506,303	209,491,680	77.6	60,462,937	32,282,525	18,599,883	27,511,514
Indiana Harbor Belt	Nov.	120	.....	.....	597,917	10,000	50,000	2,932	238,468	19,062	329,030	55	268,887	231,416	139,935	62,294
	11 mos.	119	.....	.....	6,732,265	565,000	601,000	41,871	2,633,359	220,559	4,203,193	62.4	2,529,072	2,039,216	1,399,324	1,396,379
Pittsburgh & Lake Erie	Nov.	235	1,095,324	43,509	1,162,392	74,336	418,525	22,312	392,887	36,014	942,374	81.1	220,018	115,696	237,169	255,099
	11 mos.	235	10,535,548	608,306	11,481,401	937,736	4,049,660	287,666	4,399,152	640,761	10,330,076	90.0	1,151,325	150,271	1,480,363	3,079,827
New York, Chicago & St. Louis	Nov.	1,691	2,136,250	56,942	2,285,171	216,201	388,992	98,476	845,181	109,614	1,659,632	72.6	625,539	519,992	273,116	—80,840
	11 mos.	1,695	25,007,537	850,354	26,917,883	3,406,983	4,604,848	1,184,129	9,984,570	1,351,997	20,518,223	76.2	6,399,660	4,531,650	1,872,615	2,336,089
N. Y., New Haven & Hartford	Nov.	2,066	3,193,301	1,861,849	5,732,433	673,777	863,770	78,436	2,154,298	229,468	4,120,127	71.9	1,612,306	1,286,702	775,723	1,548,275
	11 mos.	2,077	37,823,454	22,744,947	68,999,284	8,682,331	10,456,303	924,659	24,660,551	2,688,825	48,817,419	70.8	20,181,865	15,701,269	10,300,004	17,188,299

Continued on second left-hand page



MODERN POWER RETURNS 38

Even Under Existing

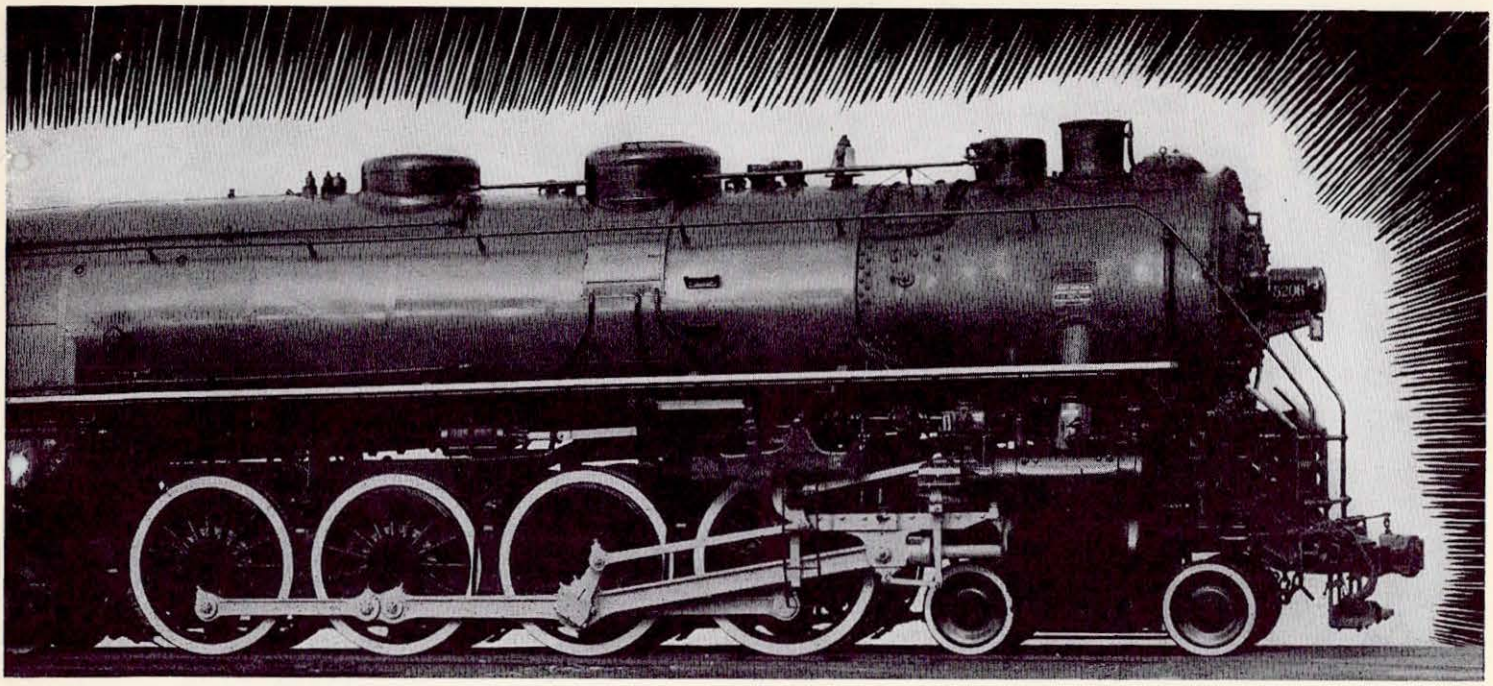
$900,000 a year is being saved by the Lehigh Valley on its recent investment of $2,340,000 in modern power—an annual return of 38 per cent. It took courage and vision to spend this money under existing light traffic conditions—but it paid—and paid big. This figure is based on the present utilization of the 20 modern locomotives acquired to replace 40 of the eight-year-old Mikados and fourteen-year-old Pacifics on the Niagara frontier—Jersey City runs.

There could hardly be a better demonstration of the economic value of modern power and how a railroad can improve its earning capacity by replacing obsolete power with modern power.

The $900,000 annual saving mentioned at the outset represents direct operating economies resulting from increased tonnages, which have permitted the elimination of 650,000 train-miles a year, greater fuel efficiency, fewer water stops and reduced helping services. The 20 new locomotives replaced 40 of the older 4-6-2 and 2-8-2 types on the Niagara frontier-Jersey City runs. With a reassignment of these latter and of others which they in turn supplant, the resultant total saving is expected to become more than $1,000,000 a year.

The distance between Suspension Bridge, N. Y., the Lehigh Valley's Niagara frontier interchange point, and its Oak Island yard in Jersey City is 449 miles. The preponderance of traffic is eastbound, and the ruling grade in that direction is between Coxton, Pa., and Mountain Top, a distance of 20 miles with a rise of 65 ft. to the mile. Here the old locomotives, hauling from 2,200 to 2,500 tons, required one and sometimes two helpers, whereas the new locomotives can haul from 3,000

AMERICAN LOCO
30 CHURCH STREET



PER CENT ON INVESTMENT

Light Traffic Conditions

to 3,500 tons with one helper. The result has been a reduction of five helping trips per day in this district. A like reduction has been made in the district between Easton, Pa., and West Portal, N. J., where the eastbound rise is 22 ft. per mile, and the westbound, 47 ft. No helping service is now required on this section of the line for trains hauled by the new locomotives.

Three of the older locomotives were assigned to each through run from Suspension Bridge to Jersey City, which now requires but one of the new locomotives. Changes were formerly made at Manchester, N. Y., and Sayre, Pa. To handle each round-trip daily schedule, only three of the new locomotives are now required. They are operated on a "first in-first out" basis, and each makes approximately 10,000 miles a month.

Fuel economies result from the fact that the more powerful locomotives will, with the same fuel consumption, haul heavier trains and thus produce more gross ton-miles per pound of coal; the saving in fuel on this unit basis is about 10 per cent. Also, there is a considerable saving in fuel as a result of reduced stand-by losses. The trains now being hauled consist of from 80 to 90 cars, or 25 more cars than the old locomotives handled, while schedules have been accelerated by 10 to 15 per cent.

What modern power has done for the Lehigh Valley it can do for other roads. And let us emphasize these points. The cost of obsolescence in the case of locomotives is particularly large because so many major improvements which reduce operating expenses have been made during the past five years. Furthermore, the loss on old locomotives costs more than replacement with modern power. Reluctance to recognize these facts is costing the railways annually millions of dollars in net revenue.

MOTIVE COMPANY
NEW YORK CITY

Revenues and Expenses of Railways

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
New York Connecting	Nov.	20	$236,709	.....	$243,684	$11,114	$6,139	.....	$43,729	$908	$61,887	25.4	$181,797	$144,297	$104,332	$34,661
	11 mos.	20	2,177,104	.....	2,291,357	139,836	55,168	.....	324,870	11,173	531,047	23.2	1,760,310	1,353,210	920,901	547,496
New York, Ontario & Western	Nov.	568	660,596	11,142	764,736	83,511	149,504	11,118	314,255	24,740	584,619	76.4	180,117	160,000	113,466	62,567
	11 mos.	568	7,785,865	588,842	9,666,799	1,164,027	1,658,437	148,088	3,606,551	267,546	6,877,698	71.1	2,789,101	2,278,253	1,676,203	1,645,975
Norfolk & Western	Nov.	2,234	5,917,367	110,113	6,220,150	503,290	907,335	109,534	1,327,038	216,845	3,077,118	49.5	3,143,032	2,517,397	2,759,186	1,778,581
	11 mos.	2,265	53,453,367	1,529,437	57,036,631	5,970,579	10,286,129	1,227,931	14,490,281	2,559,889	34,682,178	60.8	22,354,453	15,770,574	16,909,542	21,466,469
Norfolk Southern	Nov.	932	278,223	5,397	299,132	69,332	62,606	20,671	141,046	24,528	318,183	106.4	—19,051	—62,861	—73,616	—6,936
	11 mos.	932	3,629,961	99,504	3,925,356	698,695	705,248	230,388	1,698,890	232,714	3,565,915	90.8	359,441	—121,643	—260,357	373,220
Northern Pacific	Nov.	6,735	3,358,099	206,384	3,927,950	344,261	930,241	133,505	1,525,148	246,810	3,233,815	82.3	694,135	277,658	535,802	753,723
	11 mos.	6,735	36,020,433	3,334,967	43,609,688	5,614,551	10,480,802	1,752,991	17,066,406	2,853,506	38,341,259	87.9	5,268,429	—1,297,263	1,489,776	5,697,949
Northwestern Pacific	Nov.	441	101,953	71,686	201,688	35,225	38,909	3,499	131,766	14,704	223,790	111.0	—22,102	—44,827	—55,216	—80,411
	11 mos.	441	1,641,932	1,011,146	2,978,750	463,831	557,781	54,321	1,573,052	166,481	2,823,346	94.8	155,404	—144,254	—279,437	—221,140
Oklahoma City-Ada-Atoka	Nov.	132	20,084	341	22,614	4,381	1,366	701	10,263	1,413	18,124	80.1	4,490	793	—5,557	—1,863
	11 mos.	132	327,618	5,029	354,056	82,172	22,878	10,116	125,416	18,316	258,887	73.1	95,169	49,965	—30,543	—1,496
Pennsylvania Railroad	Nov.	10,897	19,351,169	4,038,688	26,139,739	1,903,682	4,690,750	542,060	9,256,133	1,287,026	17,943,416	68.6	8,196,323	6,048,291	4,708,444	3,798,237
	11 mos.	10,897	217,850,472	55,183,824	306,530,974	24,015,257	59,451,739	6,671,598	113,011,576	15,297,364	221,945,153	72.4	84,585,821	57,444,248	46,559,004	48,790,645
Long Island	Nov.	399	505,120	1,357,895	1,987,496	166,537	265,822	11,173	862,737	52,660	1,358,951	68.4	628,545	475,496	285,064	259,881
	11 mos.	399	6,187,951	18,537,005	26,167,302	1,959,015	3,535,308	150,160	10,824,796	617,498	17,087,982	65.3	9,079,320	6,704,103	4,688,820	6,895,449
Peoria & Pekin Union	Nov.	17	11,931	.....	72,639	10,504	8,693	1,924	33,194	11,811	66,126	91.0	6,513	—2,427	18,179	13,371
	11 mos.	17	108,611	Dr. 3	788,450	92,194	84,171	21,173	370,486	99,300	667,324	84.6	121,126	—39,779	207,317	189,280
Pere Marquette	Nov.	2,320	1,570,875	50,967	1,714,045	210,617	401,639	59,421	678,995	90,963	1,451,648	84.7	262,397	137,551	—2,851	63,808
	11 mos.	2,313	17,512,819	808,934	19,551,186	2,639,373	4,396,313	679,284	7,859,531	1,089,856	16,743,143	85.6	2,808,043	1,333,785	144,473	1,199,073
Pittsburg & Shawmut	Nov.	102	75,400	522	76,609	10,404	23,452	1,404	18,378	5,696	59,334	77.5	17,275	17,132	15,314	24,420
	11 mos.	102	724,962	6,361	740,624	100,423	244,952	16,423	190,788	48,404	600,743	81.1	139,881	128,412	115,086	226,643
Pittsburgh & West Virginia	Nov.	138	175,903	Dr. 1	189,528	20,730	48,932	12,531	39,642	13,147	141,968	74.9	47,560	64,685	102,396	38,383
	11 mos.	138	1,906,336	852	2,062,521	216,400	588,379	151,361	420,557	156,266	1,609,969	78.1	452,552	314,973	547,961	575,791
Pittsburg, Shawmut & Northern	Nov.	197	77,054	237	79,107	13,454	17,315	1,160	29,965	6,332	68,226	86.2	10,881	8,426	5,938	6,422
	11 mos.	197	827,121	2,702	855,418	189,348	203,706	16,674	331,754	72,995	814,477	95.2	40,941	13,167	—30,752	178,306
Reading	Nov.	1,461	3,532,961	243,907	4,017,278	260,165	830,676	69,093	1,545,185	180,864	2,901,906	72.2	1,115,372	1,012,097	998,611	1,407,968
	11 mos.	1,460	40,758,038	3,078,592	47,422,400	4,017,388	9,816,758	838,932	18,788,259	2,086,138	35,761,299	75.4	11,661,101	10,285,126	10,001,670	7,656,197
Atlantic City	Nov.	163	80,859	32,700	121,512	16,745	15,957	3,103	105,405	3,802	145,113	119.4	—23,601	—61,971	—67,175	—103,057
	11 mos.	163	779,393	940,746	1,847,026	237,588	194,606	35,462	1,339,647	43,226	1,852,055	100.3	—5,029	—433,557	—505,574	—535,475
Richmond, Fredericksburg & Potomac	Nov.	117	227,991	99,874	409,165	37,335	84,395	8,093	179,860	28,171	345,016	84.3	64,149	38,795	13,372	9,286
	11 mos.	117	3,216,948	1,399,537	5,756,665	528,859	1,184,185	98,734	2,325,530	334,981	4,584,563	79.6	1,172,102	845,374	405,441	1,022,128
Rutland	Nov.	413	184,494	28,659	282,526	47,633	62,887	9,631	128,218	13,537	261,906	92.7	20,620	—1,063	5,601	9,211
	11 mos.	413	2,239,995	440,726	3,599,485	647,540	706,732	118,266	1,502,998	155,363	3,116,562	86.6	482,923	245,388	290,735	259,789
St. Louis-San Francisco	Nov.	5,266	2,807,828	199,966	3,292,179	502,064	824,058	86,620	1,198,812	153,208	2,773,799	84.3	518,380	311,694	301,390	298,907
	11 mos.	5,266	31,623,616	2,860,774	37,779,011	5,189,017	8,312,500	1,081,841	13,295,510	1,823,430	29,851,284	79.0	7,927,727	4,499,807	3,986,320	9,741,640
Ft. Worth & Rio Grande	Nov.	233	35,825	1,699	43,570	22,644	13,033	2,685	23,503	3,460	65,261	149.8	—21,691	—21,475	—28,113	—15,443
	11 mos.	233	356,302	17,072	439,483	210,728	136,197	29,916	263,639	42,271	682,314	155.3	—242,831	—287,955	—368,547	—315,416
St. Louis, San Francisco & Texas	Nov.	262	78,665	995	82,646	17,592	21,357	5,122	36,107	7,135	87,313	105.6	—4,467	—6,913	—37,168	4,252
	11 mos.	262	914,885	7,033	962,191	212,261	207,777	56,509	435,474	81,184	993,103	103.2	—30,912	—77,452	—397,006	—233,353
St. Louis Southwestern Lines	Nov.	1,913	944,377	15,096	1,012,681	160,644	184,155	83,081	376,571	68,751	877,307	86.6	135,374	83,391	5,136	259,526
	11 mos.	1,913	10,725,296	212,253	11,639,367	1,703,370	1,944,391	896,745	4,190,973	919,978	9,731,247	83.6	1,908,120	996,749	—174,308	2,306,368
San Diego & Arizona	Nov.	155	9,253	Dr. 154	10,529	8,207	7,505	1,695	8,748	4,827	31,579	299.9	—21,050	—24,303	—24,348	—16,822
	11 mos.	155	286,623	39,349	346,141	261,194	99,479	21,925	151,672	49,864	588,264	169.9	—242,123	—285,284	—281,909	11,643
Seaboard Air Line	Nov.	4,389	1,984,518	177,059	2,404,118	406,096	582,003	123,616	930,559	130,221	2,189,469	91.1	214,649	63,465	3,239	106,477
	11 mos.	4,427	22,786,195	2,477,605	28,087,406	4,605,413	6,218,522	1,573,173	10,868,535	1,557,615	25,112,160	89.4	2,975,246	757,947	80,802	2,518,382
Southern Railway	Nov.	6,711	4,819,619	529,425	5,887,359	798,393	1,334,517	139,645	2,235,268	240,092	4,780,476	81.2	1,106,883	715,857	575,026	569,262
	11 mos.	6,719	53,558,351	7,346,935	66,940,365	9,817,977	15,794,081	1,772,324	25,763,746	3,029,268	56,615,378	84.6	10,324,987	4,590,180	3,043,860	7,931,306
Alabama Great Southern	Nov.	315	271,853	35,049	338,101	52,324	94,576	9,065	105,433	14,885	278,426	82.3	59,675	29,516	18,729	—20,331
	11 mos.	315	2,974,341	477,685	3,796,580	660,478	1,172,157	122,584	1,411,781	186,237	3,584,553	94.4	212,027	—197,648	—213,856	289,433
Cinn,, New Orleans & Tex. Pac	Nov.	337	717,731	50,550	819,925	85,121	198,089	22,241	215,813	38,931	563,778	68.8	256,147	203,999	201,893	49,896
	11 mos.	337	8,023,240	693,618	9,336,847	1,282,197	2,468,944	277,349	2,721,121	470,366	7,270,226	77.9	2,066,621	1,458,527	1,544,405	1,782,280
Georgia Southern & Florida	Nov.	397	109,403	15,186	140,346	22,533	34,936	1,487	44,581	2,413	108,043	77.0	32,303	20,493	28,308	1,816
	11 mos.	397	1,330,946	236,149	1,741,449	330,724	463,907	19,692	608,596	25,697	1,476,225	84.8	265,224	80,336	156,117	134,729

Continued on next left-hand page

COLD WEATHER
WON'T WEAKEN THESE FORGINGS

EPIDEMICS of forging failures have long been associated with the advent of cold weather on the railroads. » Ordinary forging steels become brittle at the low temperatures encountered on Northern roads. But Republic metallurgists found an answer to this as they have to so many railroad steel problems. » An Agathon Alloy forging steel was developed that retains its strength and toughness at any atmospheric temperature. Failures due to cold weather brittleness are now a thing of the past. » Once again from the laboratories of Republic has come a better material to reduce repair costs and prolong the life of equipment. » Wherever you use iron or steel consult Republic Steel Corporation for better materials.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

CENTRAL ALLOY DIVISION

REPUBLIC STEEL CORPORATION
MASSILLON OHIO

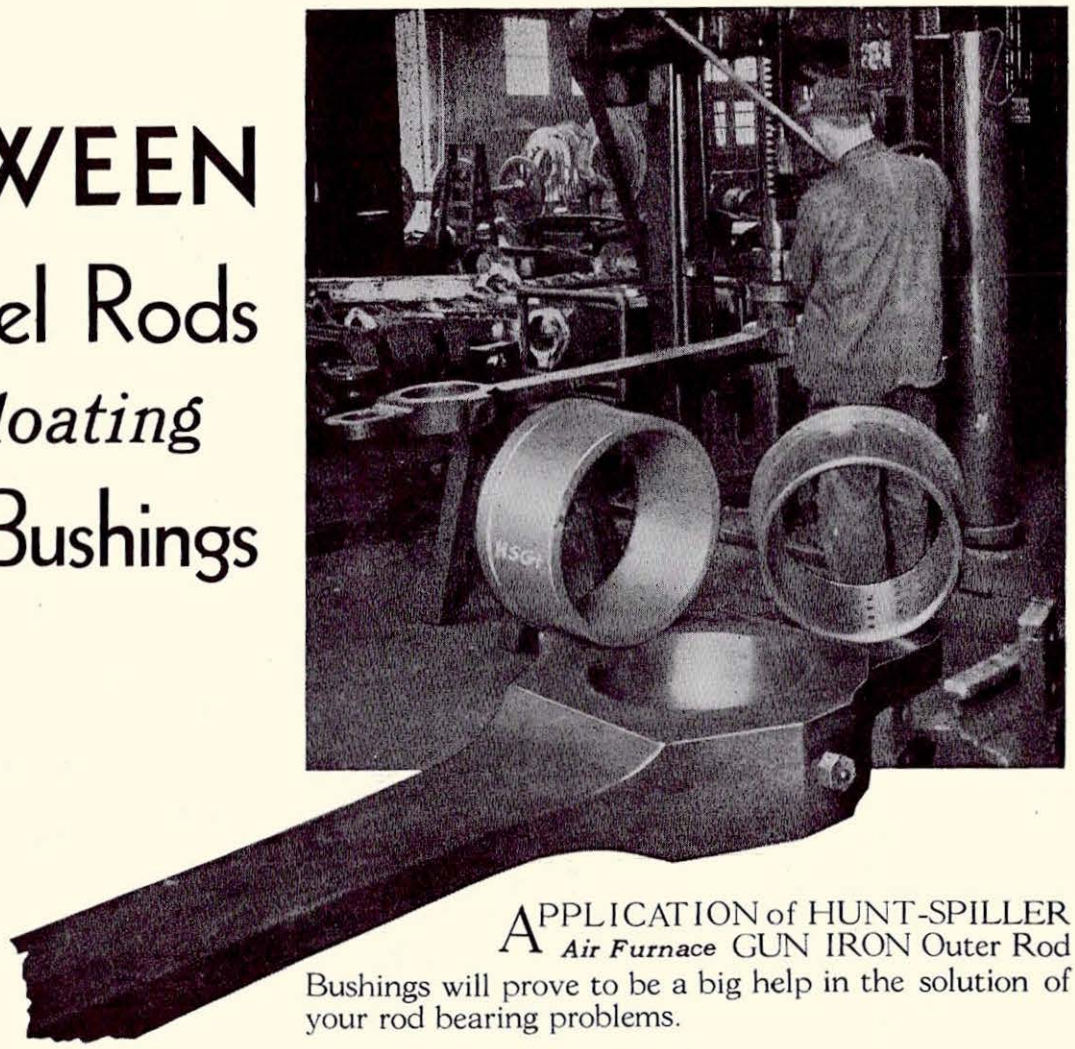
AGATHON STEELS

Revenues and Expenses of Railways

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1931
New Orleans & Northeastern	Nov.	204	$112,729	$16,590	$141,698	$20,938	$44,746	$5,221	$55,152	$9,512	$137,037	96.7	$4,661	—$27,288	—$40,787	—$45,049
	11 mos.	204	1,439,065	239,825	1,827,855	325,512	514,655	72,047	733,375	113,695	1,778,686	97.3	49,169	—294,219	—404,770	—363,113
Northern Alabama	Nov.	99	47,748	718	49,875	7,835	1,472	786	15,082	1,840	27,015	54.2	22,860	20,217	7,880	—4,560
	11 mos.	99	411,164	11,538	440,402	112,853	15,315	11,921	162,694	22,912	325,693	74.0	114,709	63,514	—80,764	—74,108
Southern Pacific	Nov.	9,101	5,986,694	1,178,269	8,106,947	993,334	1,432,257	272,245	3,121,687	528,415	6,503,973	80.2	1,602,974	809,272	479,090	717,106
	11 mos.	9,103	73,391,485	16,971,086	100,044,022	10,899,290	17,638,251	3,184,825	36,828,390	6,050,733	76,649,861	76.6	23,394,161	12,284,503	7,676,044	19,339,599
So. Pac. Steamship Lines	Nov.	....	331,367	11,640	351,454	16,103	96,773	16,836	258,887	21,397	409,996	116.6	—58,542	—59,299	—59,431	24,953
	11 mos.	....	3,663,165	259,084	4,108,337	165,801	1,198,086	194,620	3,077,860	289,950	4,926,317	119.8	—817,980	—830,548	—831,400	—710,390
Texas & New Orleans	Nov.	4,602	1,986,861	212,392	2,523,803	419,016	472,301	120,029	890,725	221,773	2,136,044	84.6	387,759	176,029	29,312	138,332
	11 mos.	4,614	22,260,008	2,927,387	28,726,315	4,707,574	5,803,463	1,383,740	10,726,055	2,470,824	25,229,685	87.8	3,496,630	655,616	—1,345,719	2,986,988
Spokane, Portland & Seattle	Nov.	552	288,935	17,797	344,730	33,288	58,386	9,269	162,485	22,030	286,465	83.1	58,265	—16,530	—40,873	—9,343
	11 mos.	553	3,720,198	388,365	4,564,754	561,213	674,855	116,219	1,674,582	238,846	3,274,701	71.1	1,290,053	452,115	295,752	847,303
Tennessee Central	Nov.	295	157,203	4,384	169,858	26,468	26,061	5,122	56,108	11,480	125,184	73.7	44,674	40,455	27,528	19,529
	11 mos.	295	1,555,444	50,224	1,696,121	274,952	249,803	70,190	627,334	114,732	1,335,846	78.8	360,275	313,149	176,282	230,323
Terminal R. R. Assn. of St. Louis	Nov.	55	.....	.....	427,786	64,309	29,720	3,418	216,989	19,405	336,050	78.6	91,736	6,095	72,780	113,734
	11 mos.	55	.....	.....	5,220,511	684,344	345,999	42,175	2,566,334	205,807	3,872,519	74.2	1,347,992	397,165	1,154,523	1,706,938
Texas & Pacific	Nov.	1,950	1,590,212	166,439	1,969,739	173,667	322,498	63,752	561,039	101,424	1,239,645	62.9	730,094	643,918	545,598	466,834
	11 mos.	1,950	15,225,302	2,095,293	19,612,986	1,915,740	3,492,357	751,162	6,197,204	1,185,882	13,727,187	70.0	5,885,799	4,694,609	3,364,000	5,422,026
Texas-Mexican	Nov.	162	44,006	758	49,305	14,820	13,269	3,211	26,033	6,088	62,988	127.7	—13,683	—18,892	—20,804	—23,900
	11 mos.	162	537,989	8,914	609,039	113,655	126,183	34,019	249,644	73,122	594,878	97.7	14,161	—43,194	—75,812	—139,230
Toledo, Peoria & Western	Nov.	239	126,567	16	128,875	20,402	31,409	13,664	35,239	7,303	108,017	83.8	20,858	17,262	5,823	—3,514
	11 mos.	239	1,365,742	404	1,387,461	318,814	154,020	139,816	428,277	103,828	1,144,755	82.5	242,706	205,220	93,353	146,507
Toledo Terminal	Nov.	28	.....	.....	66,452	3,455	10,381	452	29,480	4,886	48,654	73.2	17,798	7,677	22,658	23,839
	11 mos.	28	.....	.....	687,963	59,316	124,638	5,413	315,583	53,133	558,049	81.1	129,914	7,755	163,094	295,440
Union R. R. of Penna	Nov.	45	.....	.....	152,169	24,552	101,474	128	83,288	15,449	224,891	147.8	—72,722	—78,147	—63,365	377,964
	11 mos.	45	.....	.....	1,802,994	507,610	1,038,960	1,584	1,023,903	155,471	2,727,528	151.3	—924,534	—997,804	—747,671	872,159
Union Pacific	Nov.	3,768	4,617,996	349,585	5,410,134	398,272	992,364	113,900	1,628,584	263,584	3,463,614	64.0	1,946,520	1,880,053	1,500,497	2,601,366
	11 mos.	3,768	50,188,330	5,629,014	61,637,281	4,822,850	11,519,580	1,389,062	18,772,668	3,183,739	40,552,640	65.8	21,084,641	16,855,283	13,689,078	17,674,327
Oregon Short Line	Nov.	2,504	1,687,725	74,093	1,887,457	113,672	208,464	31,225	567,572	84,677	1,019,106	54.0	868,351	636,903	540,818	494,206
	11 mos.	2,505	16,100,737	1,256,486	18,813,155	2,038,563	2,515,163	436,609	6,248,700	1,106,897	12,620,291	67.1	6,192,864	3,463,252	2,493,472	3,055,251
Oregon-Wash. R. R. & Nav. Co.	Nov.	2,338	838,571	61,872	1,013,241	121,500	134,486	47,661	461,622	83,223	852,908	84.2	160,333	40,783	—52,459	116,533
	11 mos.	2,338	9,677,735	1,049,389	12,194,514	1,707,098	1,789,960	607,909	5,400,127	1,041,483	10,629,756	87.2	1,564,758	—73,525	—1,261,436	—63,875
Los Angeles & Salt Lake	Nov.	1,246	942,628	91,356	1,115,105	76,400	158,243	52,823	403,473	57,225	773,793	69.4	341,312	250,042	131,838	135,629
	11 mos.	1,249	11,232,192	1,715,351	14,097,175	1,319,488	1,977,801	568,704	4,563,269	718,243	9,506,834	67.4	4,590,341	3,021,156	1,599,959	1,266,705
St. Joseph & Grand Island	Nov.	258	182,540	2,117	192,206	14,712	22,302	2,150	62,674	12,245	114,083	59.4	78,123	70,006	45,621	55,375
	11 mos.	258	1,994,016	31,490	2,126,440	254,420	261,487	27,194	721,142	153,696	1,417,939	66.7	708,501	584,815	339,974	370,494
Utah	Nov.	111	115,631	.....	115,817	4,118	24,245	411	22,459	4,579	55,367	47.8	60,450	48,122	38,050	53,261
	11 mos.	111	967,258	.....	970,276	127,891	256,994	4,222	216,562	51,888	655,970	67.6	314,306	229,168	92,118	124,820
Virginian	Nov.	608	1,007,032	3,712	1,061,631	96,814	178,742	15,154	208,010	40,910	539,070	50.8	522,561	392,510	479,902	430,111
	11 mos.	608	10,976,514	66,801	11,592,642	1,174,503	2,210,800	176,801	2,325,292	346,925	6,217,445	53.6	5,375,197	3,870,074	4,573,189	5,795,301
Wabash	Nov.	2,523	2,631,831	195,356	3,053,587	150,479	500,830	139,844	1,254,414	129,170	2,189,697	71.7	863,890	686,531	319,505	—836,969
	11 mos.	2,523	29,896,297	2,321,370	34,748,714	4,463,780	5,713,305	1,687,616	14,717,104	1,703,529	28,438,188	81.8	6,310,526	4,028,724	180,065	—131,991
Ann Arbor	Nov.	293	239,361	2,393	249,472	25,914	46,016	11,114	105,651	10,498	199,206	79.9	50,266	36,453	17,347	32,055
	11 mos.	293	2,760,581	37,847	2,904,906	373,489	570,840	142,228	1,261,626	124,578	2,473,190	85.1	431,716	245,835	44,333	62,214
Western Maryland	Nov.	891	951,558	5,325	996,372	115,960	177,737	29,678	249,327	35,877	611,576	61.4	384,796	319,796	316,895	357,044
	11 mos.	891	10,358,091	84,161	11,019,137	1,303,417	1,937,523	404,135	2,882,182	418,349	6,897,051	62.6	4,122,086	3,407,086	3,335,675	3,995,860
Western Pacific	Nov.	1,163	776,365	13,420	828,596	139,371	137,086	54,877	333,311	33,786	718,203	86.7	110,393	47,978	17,955	49,809
	11 mos.	1,112	9,029,052	367,362	10,102,017	1,203,739	1,749,101	644,644	4,013,836	409,372	8,359,821	82.8	1,742,196	804,291	590,101	276,979
Wheeling & Lake Erie	Nov.	511	726,583	2,254	768,878	64,440	192,585	26,965	230,835	23,520	538,266	70.0	230,612	137,354	127,035	—7,278
	11 mos.	511	7,329,100	33,505	7,789,120	823,890	2,003,362	322,432	2,500,343	304,851	5,954,657	76.4	1,834,463	895,146	670,666	1,141,137
Wichita Falls & Southern	Nov.	203	60,514	37	61,970	11,125	7,329	1,576	13,846	2,608	36,484	58.87	25,486	21,314	17,751	2,544
	11 mos.	303	529,229	522	550,374	110,614	82,013	19,794	145,961	34,873	393,255	71.45	157,119	111,233	72,779	58,726

BETWEEN the Steel Rods *and Floating* Brass Bushings



APPLICATION of HUNT-SPILLER *Air Furnace* GUN IRON Outer Rod Bushings will prove to be a big help in the solution of your rod bearing problems.

You will notice a big difference in the mileage obtained from all wearing parts. You will have fewer failures . . . less trouble with hot pins and the maintenance sheets will show a big reduction in rod bearing maintenance costs.

Bushings made of HUNT-SPILLER *Air Furnace* GUN IRON always retain a smooth surface—heat less rapidly and their wear-resisting properties insure longer mileage between renewals.

HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Parts Finished For Application
Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

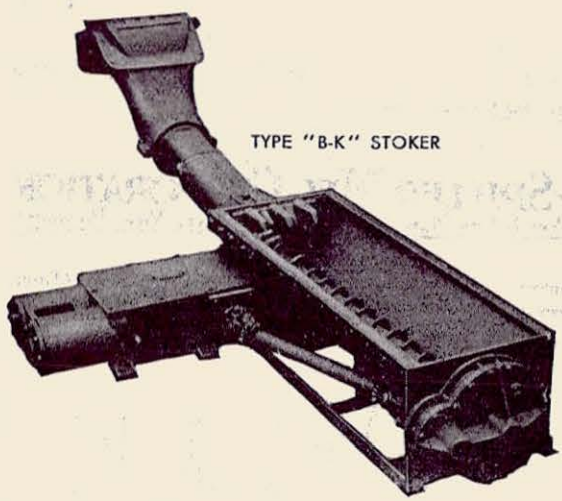
HUNT-SPILLER MFG. CORPORATION
J. G. Platt, Pres. & Gen. Mgr. — V. W. Ellet, Vice-President.

Office & Works
383 Dorchester Ave. South Boston, 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER *Air Furnace* GUN IRON

The Test Comes with WINTER



TYPE "B-K" STOKER

THE test of locomotive performance comes with cold weather when every pound of boiler capacity is needed to get the train over the road on time.

Compare the performance of stoker fired power with that of hand fired locomotives.

You will see stoker fired power doing a little more than the hand fired power of the same class.

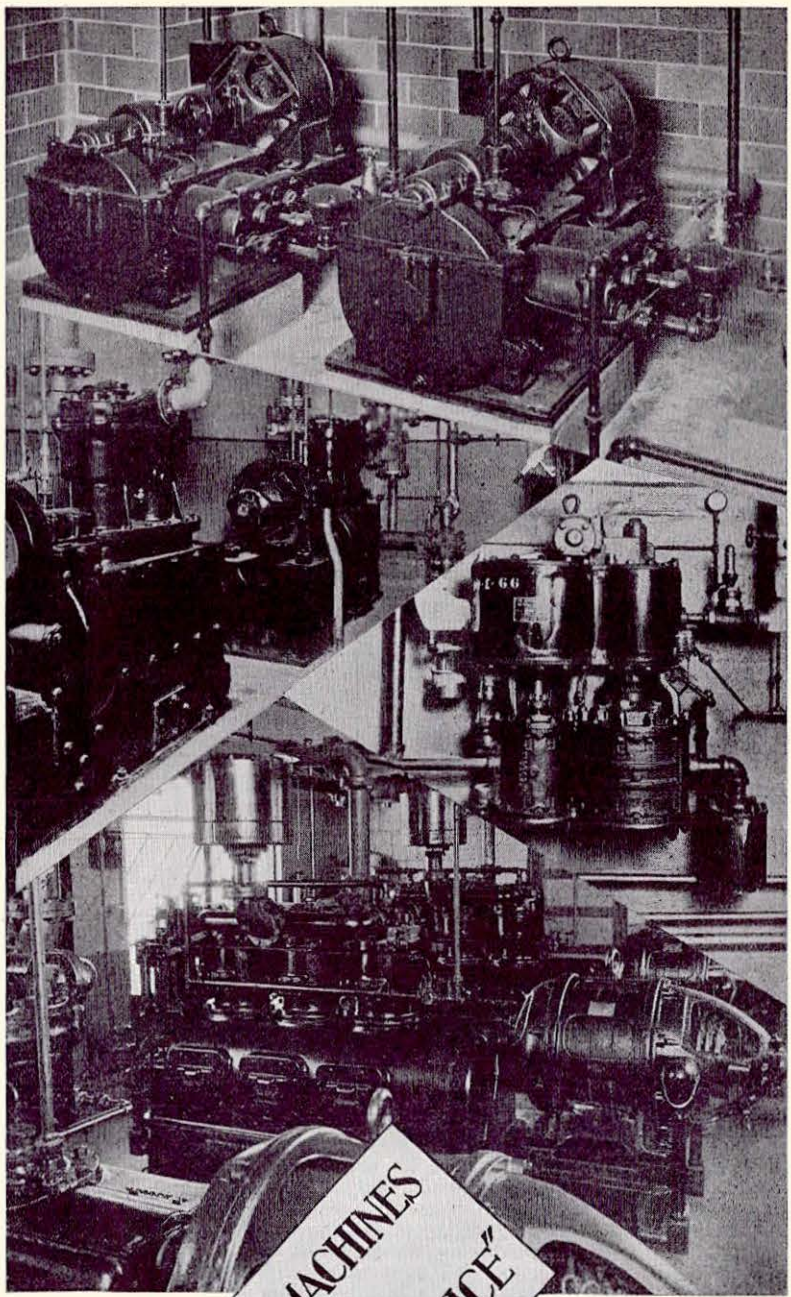
You will see stoker fired power steaming better and having fewer flue failures and generally lower boiler maintenance.

You will see fewer train delays with stoker fired power, and a higher average speed between terminals.

Remember stoker firing is economical on every class of power and Standard stokers are readily applicable to any locomotive regardless of size.

THE STANDARD STOKER COMPANY, Inc.

NEW YORK CHICAGO ERIE



VARIETY IN UNIFORMITY

Westinghouse Air Compressors are available in many types and sizes—ranging from 2½ to 300 cu. ft. displacement — for every conceivable pneumatic requirement in railroad shops and yards . . . While there is diversity in form and purpose there is uniformity in quality and performance . . . These compressors possess unique design features and are well built. They are noted for reliable, economical operation, and for unusually long life.

"QUALITY MACHINES FOR QUALITY SERVICE"

WESTINGHOUSE TRACTION BRAKE CO.

Industrial Division

Pittsburgh, Penna.

WESTINGHOUSE AIR COMPRESSORS

Valuable Books for Railroad Men

The I.C.C. vs. Class I Railroads of the United States

By HORATIO L. WHITRIDGE

To find out why his Baltimore clients would not buy railroad bonds Mr. Whitridge, a securities expert, set to work with his research staff to analyze the railroad situation. The trails led to the doors of the Interstate Commerce Commission. The author presents a detailed and devastating indictment of I. C. C. policies with regard to assuring the railroads a fair return on their investment under the Transportation Act of 1920. A plan for remedying the present situation and insuring the railroads financial prosperity under private ownership is advanced.

9 x 12 inches, 174 pages, paper binding, $1.50

In Preparation

Railroad Mergers

By JOHN WILL CHAPMAN, B. S., M. C. S.

Member of Investment Staff, United States Trust Company of New York; Formerly Statistical and Security Analyst for Standard Statistics Co.

Railroad consolidation is again becoming of nationwide interest. The existing situation is fraught with danger not only for shippers and the public in general, but for the heart of the nation's investment structure. Among the topics discussed in *"Railroad Mergers"* are:

The Historical Background—Railroad Merger Problems Under the Transportation Act—Valuation of Properties—Special Problems—Progress of Mergers after the Transportation Act—Operation and Financial Problems of Future Mergers—Procedural and Legislative Problems of Future Mergers.

6 x 9 inches, 210 pages, 25 maps, cloth, $3.00

Consolidation Maps

Interstate Commerce Commission's Consolidation Plan

Twenty-one separate maps, drawn to the same scale, printed for ready comparisons on one sheet, depict the grouping of some 1300 railroads into 21 systems as approved by the Interstate Commerce Commission on December 9, 1929. Distinguishing marks show each of the component companies forming the proposed consolidated systems.

44 x 35 inches, on heavy paper, $.25

Four System Plan for Eastern Railways

Submitted to the Interstate Commerce Commission on October 3, 1931, with an application for a modification of the commission's consolidation plan of December 9, 1929.

12 x 24 inches, on heavy paper, $.15

TEN DAY FREE EXAMINATION COUPON

SIMMONS-BOARDMAN PUBLISHING CO.
30 CHURCH ST., NEW YORK.

Send me the books checked below, prepaid, for ten days' free inspection. If satisfactory I will remit the list price. Otherwise I will return the books to you without obligation

( ) I. C. C. vs. Class I Railroads, $1.50
( ) Railroad Mergers $3, (When ready)
( ) I. C. C. Consolidation Map, $.25
( ) Four System Map for Eastern R. R. $.15
( ) Regulation of Railroad Finance, $3.50
( ) Analysis of Railroad Operations, $4
( ) Railway Accounting Procedure, $5
( ) Who's Who in Railroading, $6.00

Name .....
Address .....
City ..... State .....
Company ..... Position .....
(This offer is limited to the United States and Canada) R.A. 1-14-33

For the Interpretation of Railroad Statistics

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; now Vice-President, Irving Investors' Management Company, Inc.

This standard work describes how figures produced in accounting departments should be used in the study of railroad operating results. A four page sample work-sheet is furnished for setting down basic statistics and significant averages of a railroad over a given period. The author shows how these figures reflect the various activities of a railroad, the operating efficiency of the road as a whole or of any of its departments. Classifications of the Interstate Commerce Commission are given in full in the appendix and frequent and detailed references are made to it in the text.

391 pages, forms, index, work-sheet, 6 x 9 inches, cloth, $4.00

Regulation of Railroad Finance

By JOHN H. FREDERICK, Ph. D.
FRANK T. HYPPS, Ph. D.
and JAMES M. HERRING, Ph. D.

Wharton School of Finance and Commerce University of Pennsylvania

The regulation of the financial affairs of railroads by the Federal government through the Interstate Commerce Commission, under the Transportation Act of 1920, is herein clearly explained. Various tests applied by the Commission in determining the elements of public interest to which the statute usually refers are traced, together with the nature and reasons for the Commission's action.

The granting of certificates of public convenience and necessity for the construction and abandonment of railroads, the regulation of unification through acquisition of control of one carrier by another, the regulation of interlocking directorates and the issuance of the various types of railroad securities are expertly examined. Accounting practices are touched upon.

237 pages, tables, index, 6 x 9 inches, cloth, $3.50

Railway Accounting Procedure

Edited by E. R. WOODSON

Secretary, Railway Accounting Officers Association

The official manual of the R. A. O. A. contains the mandatory and recommended rules, forms and standard practice of American railway accounting. The new edition in loose leaf form is kept up to date by yearly supplements.

1,002 pages, 7 x 9½ inches, loose leaf binder, $5.00

Who's Who in Railroading

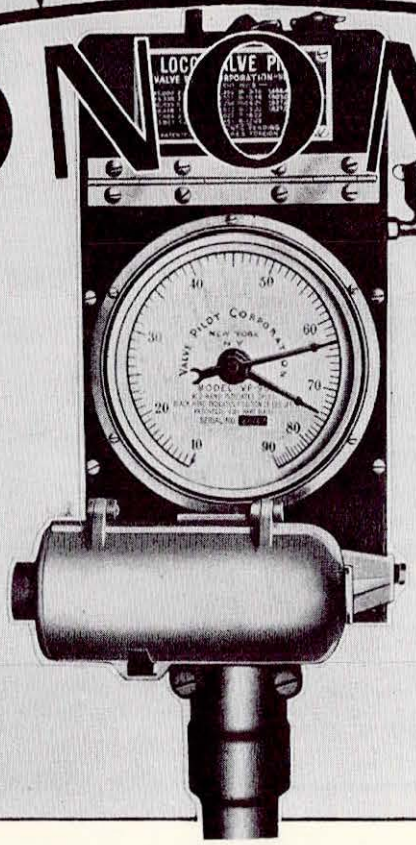
United States—Canada—Mexico—Cuba

The new Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented.

The descriptions of these leaders of the rail industry include personal information such as their family connections and social, religious and political affiliations as well as a complete outline of their professional careers. Since 1885 this book has been recognized as the standard authority in the transportation field.

Ninth Edition, 579 pages, 6 x 9 x 1⅝ inches, $6.00

LOCO VALVE PILOT ECONOMIES



MAXIMUM LOCOMOTIVE CAPACITY

MINIMUM FUEL CONSUMPTION

Over a mountain profile, LOCO VALVE PILOT reduces coal consumption 22 lb. per 1,000 gross ton-miles.

Over a rolling profile, LOCO VALVE PILOT produces a saving of six cents per 1,000 gross ton-miles.

Over a level division, LOCO VALVE PILOT produces 14 per cent more work per unit of fuel burned.

Are you using this method to lower operating costs and improve net income?

VALVE PILOT CORPORATION

230 Park Avenue, New York City

WELTRUS
Highway Crossings

Permanent » Economical

Provide great strength and the most satisfactory wearing surface --- steel and concrete. Withstand the heaviest traffic. Weltrus units protect concrete on all sides and provide complete armoring for all corners. Sections are interchangeable --- quickly installed or removed by ordinary track labor. No forms or special equipment required. Low initial cost. No maintenance expense.

Write for details and quotations.

TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
Sales and Engineering Offices in Principal Cities

MAGNUS COMPANY

(INCORPORATED)

Journal Bearings

AND

Bronze Engine Castings

New York Chicago

A. R. A.
STANDARD COUPLERS

Including
SWIVEL COUPLERS
With
SWIVEL BUTTS
Or
SWIVEL YOKES

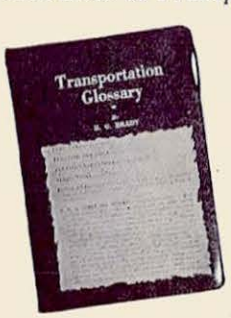
Pitt Passenger Couplers

STEEL CASTINGS

McConway & Torley Corporation
Pittsburgh, Pa.

Transportation Glossary

By H. G. BRADY
Instructor in Transportation, New York University



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms, and this book fills a long-felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

"A supplement to the dictionary to explain the technical terms in the broad field of transportation."—*Science News-Letter.*

119 pages, 5 x 7 inches, flexible binding. $1.75

Sent on Approval

Simmons-Boardman Publishing Company
The House of Transportation
30 CHURCH ST. NEW YORK

Your Man-

Why Not

Use Him?

Stett Macdonald — *a well-known Elesco service man. Each railroad has an Elesco service man at its disposal.*

Although, in general, the railroads are operating with high efficiency for the volume handled, some do not haul freight and passenger traffic as profitably as they should. The finger of failure may point to poor steamers—superheater power that is not giving its utmost because of inadequate maintenance of the superheater units.

There are degrees of unserviceability of superheater units, which may not be apparent to the railroad man, but are readily discernible to an Elesco service man—by long experience skilled in this work. If the pressure in the cylinders or the superheat has been lowered, there is a noticeable loss of efficiency, which may be due to improper maintenance of superheater units. It is good business to maintain the units at full efficiency.

Superheater units that appeared beyond salvation, have been rebuilt by the Elesco unit remanufacturing service, at a big saving to the railroads over the price of new units—and frequently, the cost is soon repaid by restoring the power to its original efficiency.

On such matters as these, call in the Elesco service man—a letter to us will bring him. His suggestions will save you money.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street
New York

ELESCO

Peoples Gas Building
Chicago

A-750

Canada: THE SUPERHEATER COMPANY, LTD., Montreal

Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Multiple Throttle

The careful investor judges a security by the history of its performance.
KERITE
in three-quarters of a century of continuous production, has established a record of performance that is unequalled in the history of insulated wires and cables.
Kerite is a seasoned security.
THE KERITE INSULATED WIRE & CABLE COMPANY INC
NEW YORK CHICAGO SAN FRANCISCO

"TIGER" BRONZE
ENGINE CASTINGS

STRONG TOUGH

ANTI-FRICTIONAL EASILY MACHINED

NATIONAL BEARING METALS CORP.
ST. LOUIS, MO.

New York, N. Y. Pittsburgh, Pa. Portsmouth, Va.
Jersey City, N. J. Meadville, Pa. St. Paul, Minn.
3

WANTED

Leather bound copies of the 1929 edition of the "Railway Engineering and Maintenance Cyclopedia." Must be in first class condition. Will pay $5.00 plus postage. Please write before sending.

Book Department
Simmons-Boardman Publishing Company
30 Church Street New York, N. Y.

Bound Volumes of Back Numbers

RAILWAY AGE RAILWAY REVIEW RAILWAY AGE GAZETTE

The following bound volumes of these old railroad magazines are available for filling out railroad library sets. In most cases there is only a single volume and the limit is six. Any will be mailed postpaid on a returnable if dissatisfied basis, on receipt of check with order at $3.00 per volume.

Railway Age
January—June, 1918
July—December, 1918
July—December, 1919
January—June, 1920
January—June, 1922
July—December, 1922
January—June, 1923
April—June, 1923
July—September, 1923
July—December, 1923
January—June, 1924
July—December, 1924
January—June, 1925
July—December, 1925
January—June, 1926
January—June, 1927
July—December, 1927
January—June, 1928

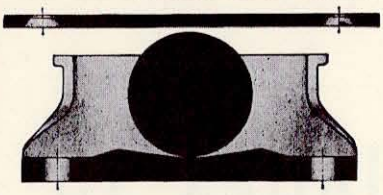
Railway Review
July—December, 1919
July—December, 1921
July—December, 1922
January—June, 1923
July—December, 1923
January—June, 1925
January—June, 1926

Railway Age Gazette
January—June, 1909
July—December, 1909
January—June, 1910
July—December, 1910
July—December, 1911
January—June, 1912
July—December, 1912
January—June, 1913
July—December, 1913
July—December, 1914
January—June, 1915
July—December, 1915
January—June, 1916
July—December, 1916
January—June, 1917
July—December, 1917

Book Department

Simmons-Boardman Publishing Company
30 Church Street New York, N. Y.

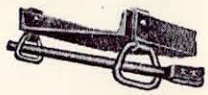
THE BUCKEYE STEEL CASTINGS CO.
COLUMBUS, OHIO
MANUFACTURER of Side Frames and Bolsters for 4-Wheel and 6-Wheel Freight Cars and Locomotive Tenders, A. R. A. Couplers, Yokes and Car Castings.


STUCKI SIDE BEARINGS
Manufactured by A. Stucki Co.
Oliver Bldg., Pittsburgh, Pa.
Canadian Representative: The Holden Co., Ltd., Montreal, Can.

UNARCO
Asbestos and Rubber Packings for Railroad Use. Asbestos Insulating Materials
UNION ASBESTOS & RUBBER CO.
310 South Michigan Ave. Chicago, Ill.

WINE RAILWAY APPLIANCE CO.
TOLEDO, OHIO
Details of our products appear in following issues of Railway Age during 1932
January 16—March 19—May 21—August 13—September 17—November 19—or Railway Mechanical Engineer.

Pittsburgh Spring & Steel Co.
1417 Farmers Bank Building, Pittsburgh, Pa.
Makers of Elliptic and Spiral SPRINGS of Every Description
of Carbon Vanadium and other alloy steels
Quality and Workmanship Guaranteed
Agencies
Washington, D. C. 324 Union Trust Bldg. | New York 2038 Grand Central Terminal | Chicago 1411 Fisher Bldg.

The "BUFFALO" Bottom Rod Support
Meeting A. R. A. Requirements.
Loop held by friction.
Obstructions swing it clear.
No bending or binding.
Made to fit any channel.
Permitting free brake movement.
Folds up for channel removal.

BUFFALO BRAKE BEAM CO.
NEW YORK
Buffalo Hamilton, Ont.

BARBER LATERAL - MOTION DEVICE
1,300,000 cars equipped
ROLLER SIDE-BEARINGS
STANDARD CAR TRUCK CO.
McCORMICK BUILDING CHICAGO

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.
Details of our products appeared in the following issues of Railway Age during 1931 and 1932:
1931—May 16—June 13—July 4—Aug. 1, 8, 15, 22, 29—Sept. 5, 12—Oct. 3—Dec. 5.
1932—Jan. 2—March 5—April 2—May 7—June 18, 25—Sept. 3.

PROFESSIONAL DIRECTORY

Your name should appear before the readers of this publication.

Your professional card should appear in this section

Robert W. Hunt Company
ENGINEERS
Inspection—Tests—Consultation
All Railway Equipment, Structures and Materials
General Office:
22nd Floor Insurance Exchange
CHICAGO
Offices in all principal cities

GET TOGETHER DEPARTMENT

Non-Display "Employment" Ads five cents a word. Count address in figuring cost. Box number requires ten words. All other classified Ads $4.00 an inch (1" x 1⅝") an insertion. Payable in advance. Railway Age, 30 Church St., New York, N. Y.

Use space in this section

REPRESENTATION

RAILWAY SALES AND ENGINEERING REPRESENTATION in the Pacific Coast and Mountain States territory. Former railway executive with several years railway supply experience wishes to take on one additional well established line of responsible manufacturer for intensive sales representation. Particularly well acquainted with operating, mechanical and maintenance of way departments. Address Box 1234, care Railway Age, Matson Bldg., San Francisco, Calif.

EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employes. Write for FREE Special Bulletin.

MISCELLANEOUS

WANTED: Might be able to use 25 to 75 second-hand modern, practically new box cars, if at a real sacrifice under existing conditions. Would be interested only in detailed specifications, dates built, present location, condition and cash price. Address Box 875, RAILWAY AGE, 30 Church Street, New York, N. Y.

POSITION OPEN

IF YOU are open to overtures for new connection, and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty-three years. Send only name and address for details. R. W. Bixby, Inc., 102 Delward Building, Buffalo, New York.

Index to Advertisers

January 14, 1933

A

American Arch Co., Inc. 17
American Locomotive Co. 18, 19
American Steel Foundries 13

B

Baldwin Locomotive Works, The... 4
Barco Manufacturing Co. 32
Bethlehem Steel Co. 2
Bixby, Inc., R. W. 29
Buckeye Steel Castings Co., The.... 29
Buffalo Brake Beam Co. 29

C

Caterpillar Tractor Co. 3
Classified Advertisements 29

D

Dearborn Chemical Co. 11

E

Edgewater Steel Co. 29

F

Franklin Railway Supply Co., Inc... 16

G

Get Together Department 29

H

Harbison-Walker Refractories Co... 17
Hunt Co., Robert W. 29
Hunt-Spiller Mfg. Corp. 21
Hutchins Car Roofing Co. 14

K

Kerite Insulated Wire & Cable Co., Inc., The 28

L

Lima Locomotive Works, Inc 15
Locomotive Firebox Co. 12

Mc

McConway & Torley Corp. 26

M

Magnus Company, Inc. 26

N

National Bearing Metals Corp. 28

P

Pittsburgh Spring & Steel Co. 29
Professional Directory 29

R

Railway Educational Bureau, The.. 29
Railway Steel-Spring Co. 31
Republic Steel Corporation 20

S

Simmons-Boardman Publishing Co. 24, 26, 28
Standard Car Truck Co. 29
Standard Stoker Co., Inc., The..... 22
Stucki Co., A. 29
Superheater Co., The 27

T

Truscon Steel Company 26

U

Union Asbestos & Rubber Co. 29
Union Metal Products Co. 10
Union Switch & Signal Co. 6, 7

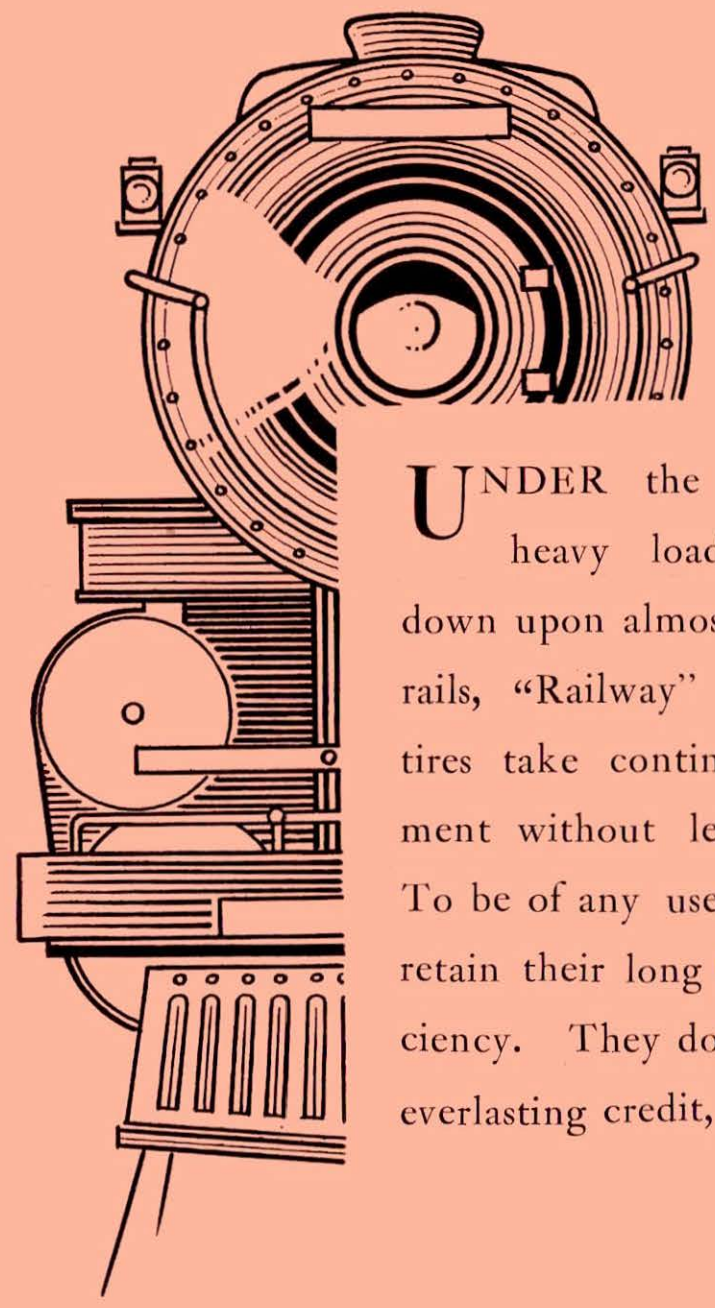
V

Valve Pilot Corp. 25

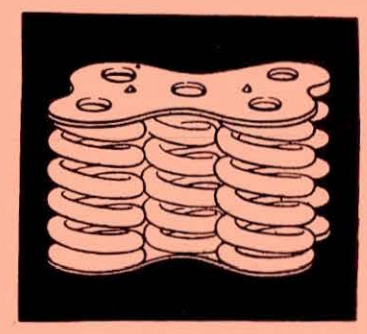
W

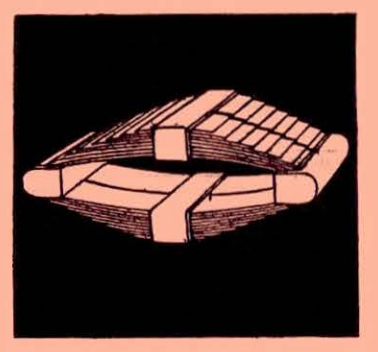
Westinghouse Elect. & Mfg. Co. .. 8, 9
Westinghouse Traction Brake Co.. 23
Wine Railway Appliance Co. 29

WITHSTANDING THE RIGORS OF MODERN RAILROAD OPERATION



UNDER the impacts of heavy loads pounding down upon almost unyielding rails, "Railway" springs and tires take continual punishment without letting down. To be of any use, they must retain their long life and efficiency. They do! To their everlasting credit, they do!



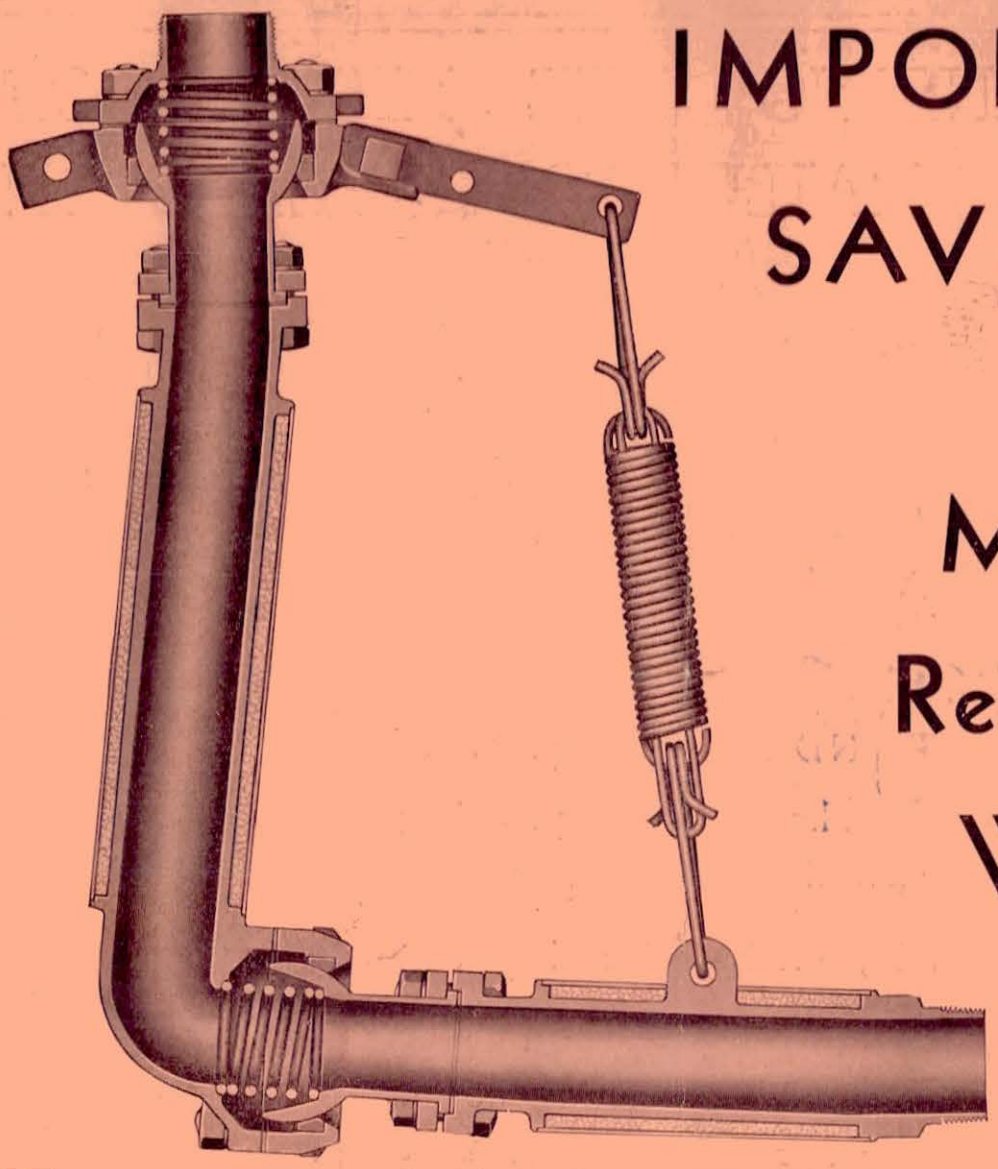


Railway Steel-Spring Company

30 CHURCH ST., NEW YORK

Branch Offices:

Chicago, Ill. Washington, D. C. Cleveland, Ohio Pittsburgh, Pa. Montreal, Que.
St. Paul, Minn. St. Louis, Mo. Denver, Colo. San Francisco, Cal.



IMPORTANT SAVINGS

Many Reasons Why

THERE are many outstanding features built into the new BARCO Steam Heat Connections which will appeal to all railroads searching for ways to reduce passenger train operating costs.

Gaskets are easily removed without disturbing the connection on the car. The threaded end which screws into the end valve is made from a steel forging, thus providing strongest construction where the greatest leverage occurs.

There are only two metal wearing parts and these are made of hardened alloy steel. There is only one ninety-degree bend — the entire connection moves easily under steam pressure and is free from leakage.

Insulation is encased in steel shells welded to the connection, thus making a permanent job. As for the gaskets, they can be depended upon to give long trouble-free service without leaking.

Barco Manufacturing Co.
1801 Winnemac Avenue, Chicago, Illinois
THE HOLDEN CO., LTD.
In Canada
Montreal—Moncton—Toronto
In Canada
Winnipeg—Vancouver

BARCO

STEAM HEAT CONNECTIONS